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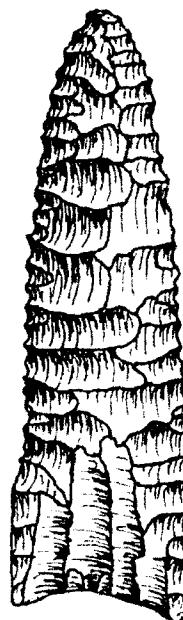
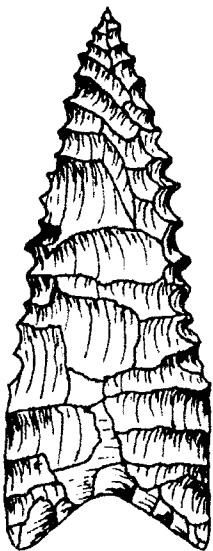
Kansas City District
Leaders in Customer Care

Timothy C. Klinger
Steven M. Imhoff
Don R. Dickson

DOWNSTREAM STOCKTON ASSESSMENTS

National Register Assessment of Prehistoric Archeological Sites
23CE46C, 23CE439, 23CE440, 23CE442, 23CE444, 23CE446, 23SR291 and 23SR1067
Downstream of the Stockton Lake Project, Cedar and St. Clair Counties, Missouri
Contract No. DACW41-90-C-0032

1992

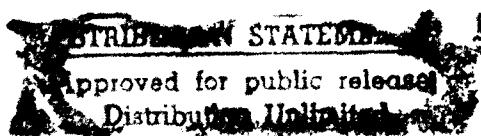


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Timothy C. Klinger, Principal Investigator



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With the exception of 23CE442, these sites all appear to represent temporary or seasonal occupations associated with resource procurement. 23CE442 may have been a Late Woodland Period base settlement. No evidence of permanent structures or midden accumulation was recovered at any of the sites. 23CE46C yielded evidence of Late Archaic (3000 BC - 1000 BC), Late Woodland (AD 500 - AD 900) and Early Mississippi Period (AD 900 - AD 1200) occupations. 23CE439 yielded evidence of Middle and Late Woodland Period (500 BC - AD 900) occupations. 23CE442 yielded evidence of a Middle or Late Woodland Period occupation, as well as nearly all of the ceramics recovered during the project. 23CE444 yielded evidence of Early Archaic (7500 BC - 5000 BC) and Late Woodland Period occupations. 23CE446 yielded evidence of Dalton (8500 BC - 7500 BC) and Early Archaic Period (7500 BC - 5000 BC) occupations. 23SR291 yielded evidence of an indeterminate prehistoric period occupation and abundant historic materials. 23SR1067 yielded evidence of Late Archaic (3000 BC - 1000 BC) and Early Woodland Period (1000 BC - 500 BC) occupations.

23CE46C, 23CE442 and 23SR1067 exhibited abundant cultural deposits that appear to be intact and can provide evidence of prehistoric use of the Sac River Valley from as early as 3000 BC through AD 1200. These sites are potentially eligible for inclusion in the National Register of Historic Places. 23CE439, 23CE444, 23CE446 and 23SR291 failed to produce data that, when viewed in its most favorable light, would make them eligible for the National Register. Deposits at these sites were sparse with no evidence that they retained sufficient integrity to produce substantial new information.

All the sites investigated are endangered by riverbank erosion to varying degrees. This is particularly so at 23CE46C and 23CE440 where our mapping, when compared to recent COE maps of the river, shows that the river has cut into them approximately 30 m over the past decade. Loss of another 5 m - 10 m of riverbank at 23CE442 would effectively destroy the site.



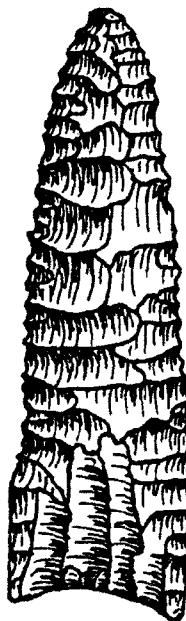
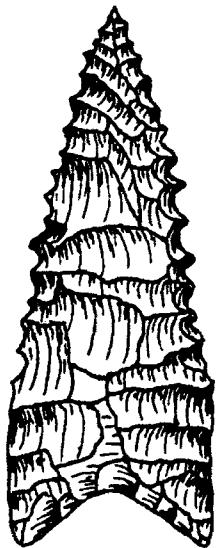
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DISCLAIMER

The study performed herein by the Contractor for the Corps of Engineers is authorized by the National Historic Preservation Act of 1966, as amended. Accomplishment of this work provides documentation evidencing compliance with Executive Order 11593 (Protection and Enhancement of the Cultural Environment, dated 13 May 1971) and Section 110 of the National Historic Preservation Act.

Funds for this investigation and report were provided by the U. S. Army Corps of Engineers. The Corps contracted with Historic Preservation Associates for this Downstream Stockton Study and may not necessarily agree with the contents of this report in its entirety. The report reflects the professional views of the Contractor who is responsible for collection of the data, analysis, conclusions and recommendations.

The Contractor designated a study team to make the investigation and the study team has drawn conclusions regarding the effects of power generation on the Sac River downstream of Stockton Dam. Since the U. S. Army Corps of Engineers does not wish to interfere with the professional independence of the study team, those conclusions remain in the study. However, it should be noted that the U. S. Army Corps of Engineers does not necessarily agree with the conclusions of the study team regarding the effects of power generation.

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Dalton Point from 23CE444
Dalton Point from 23CE446

ABSTRACT

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DOWNSTREAM STOCKTON ASSESSMENTS

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DOWNSTREAM STOCKTON ASSESSMENTS

National Register assessment of prehistoric archeological sites
23CE46C, 23CE439, 23CE442, 23CE444, 23CE446, 23SR291 and 23SR1067
Downstream of the Stockton Lake Project, Cedar and St. Clair Counties, Missouri

submitted to the Kansas City District, Corps of Engineers
by Timothy C. Klinger and Steven M. Imhoff
Historic Preservation Associates

INTRODUCTION

To fulfill its obligations under the National Historic Preservation Act of 1966 (PL89-665), the National Environmental Policy Act of 1969 (PL91-190), Executive Order 11593, the Archeological and Historic Preservation Act of 1974 (PL93-291), the Archaeological Resources Protection Act of 1979 (PL96-95) and the Procedures for the Protection of Historic and Cultural Properties (36CFR800), the Kansas City District of the U. S. Army Corps of Engineers (COE) issued RFP DACW41-90-R-0032 for National Register of Historic Places (NRHP) evaluation of 9 archeological sites situated within flowage easements along the Sac River downstream from the Stockton Dam. Contract DACW41-90-C-0032 was awarded to Historic Preservation Associates (HPA) for assessment of 9 sites.

Sites evaluated in this report were investigated during a Phase I cultural resources survey conducted for the COE by Environmental Systems Analysis, Inc. (ESA) of Shawnee Mission, Kansas. 23CE46C and 23SR291 had been previously recorded and were revisited during the ESA survey. The remaining sites were newly recorded. The purpose of this report is to document archeological test excavations that were undertaken to assess the nature, extent and significance of the sites relative to National Register of Historic Places criteria (36CFR60.4). This report follows the guidelines and standards of fieldwork and reports contained in the *Guidelines for Reporting Phase II Testing of Archaeological Site Significance and Evaluation of National Register Eligibility* (Weichman 1987), the *Master Plan for Archaeological Resource Protection in Missouri* (Weston and Weichman 1987), McGimsey and Davis (1977:64-77), Bense et al. (1986:52-62) and the Scope of Work (Appendix D). Because the sites in question are situated on privately owned lands, the cultural materials recovered remain the property of the landowners and have been returned to them according to the terms set forth in written Rights-of-Entry secured by the COE. Records documenting the investigations and the materials recovered have been submitted to the COE.

The project sponsor was the Kansas City District of the U. S. Army Corps of Engineers. The Project Manager was Ms. Camille Lechliter of the Kansas City office. Mr. Ken Lucius of the Stockton Lake office served as liaison between the field crew and the Kansas City District.

Mr. Timothy C. Klinger, Director of HPA, was the Principal Investigator. Mr. Steven M. Imhoff directed the fieldwork and was assisted by John L. Gray, Ernest W. McFeeters, James W. Smith and Steven R. Smith. Other members of the field crew included Sam Addington, Chris Bogert, Marcia Clark, Ron Pendergraph, Carl Reeves and Kim Walker.

The complete Scope of Work is presented as Appendix D. Provisions dealing specifically with the conduct of the work (including the paragraph cited) are as follows:

- The work will be restricted to Government easements [1a, 10d].
- Determine horizontal and vertical extent; temporal extent; cultural and scientific importance; NRHP eligibility; mitigation alternatives [2a].
- Develop mitigation plan for potentially eligible sites and rank priorities for sites to be mitigated [10c(3)].
- No more than 16 m² total excavation, except at sites 23CE444 and 23CE446 where no more than 30 m² will be excavated [10d(2)].
- Backhoe trenches no closer than 5 m to river bank [10d(2)(a)].
- Define temporal placement and types of sites[10d(3)].
- Collect all diagnostics and a sample of other artifacts, including historic materials [10d(4)].

Nine sites situated within flowage easements along the Sac River between miles 12.5 and 35 were to be tested. 23CE441 was deleted by Amendment No. 0002 of 22 August 1989. 23CE440 was found to be no longer within a Government easement for which landowner permission to excavate could be secured, further reducing the number of sites to 7. These sites -- 23CE46C, 23CE439 (which includes 23CE437 and 23CE438), 23CE442 (which includes 23CE443), 23CE444, 23CE446, 23SR291 and 23SR1067 -- are located next to the river and are currently endangered by river meandering. All are located in Cedar and St. Clair counties, Missouri in the Sac Watershed, a division of the Osage Prairie Study Unit (Weston and Weichman 1987:B191 - B1911) (Figure 1). The stretch of the river containing the sites begins about 500 m north (downstream) of the Caplinger Mills bridge and continues downstream a distance of about 36 km (Figure 2).

An initial visit to the project area by Timothy C. Klinger, Camille Lechliter and Ken Lucius occurred in May 1990. Mr. Klinger and Steve Imhoff visited the area again in early August 1990. Work took place at 23SR291 between 21 and 30 August 1990; at 23SR1067 between 30 August and 17 October 1990; at 23CE442 between 17 and 30 October 1990 and 16 and 23 April 1991; at 23CE446 between 30 October and 30 November 1990; at 23CE46C between 3 December 1990 and 17 January 1991; at 23CE444 between 20 February and 4 April 1991; and at 23CE439 between 28 March and 17 April 1991.

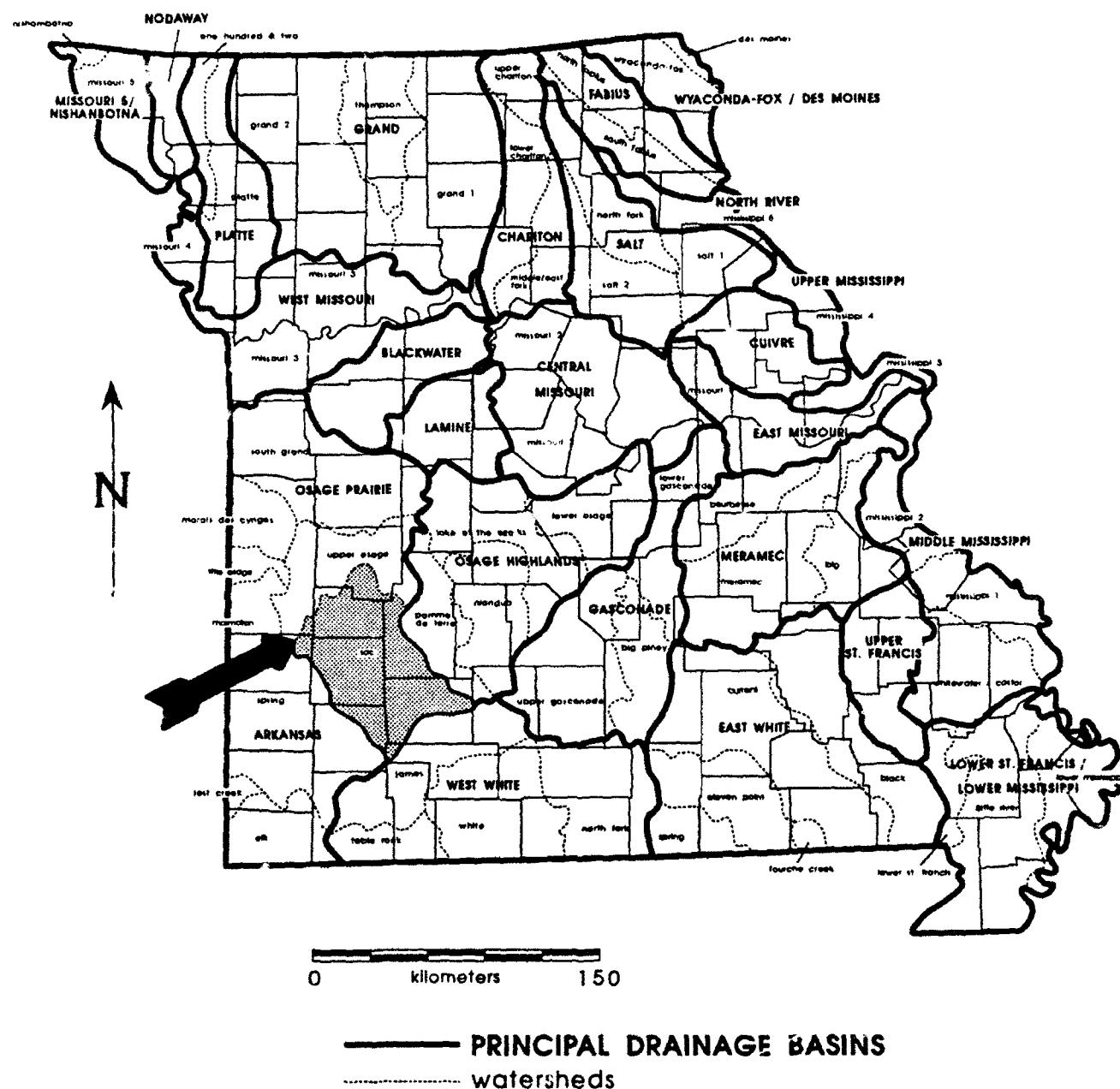


Figure 1. Missouri watersheds and general project location.

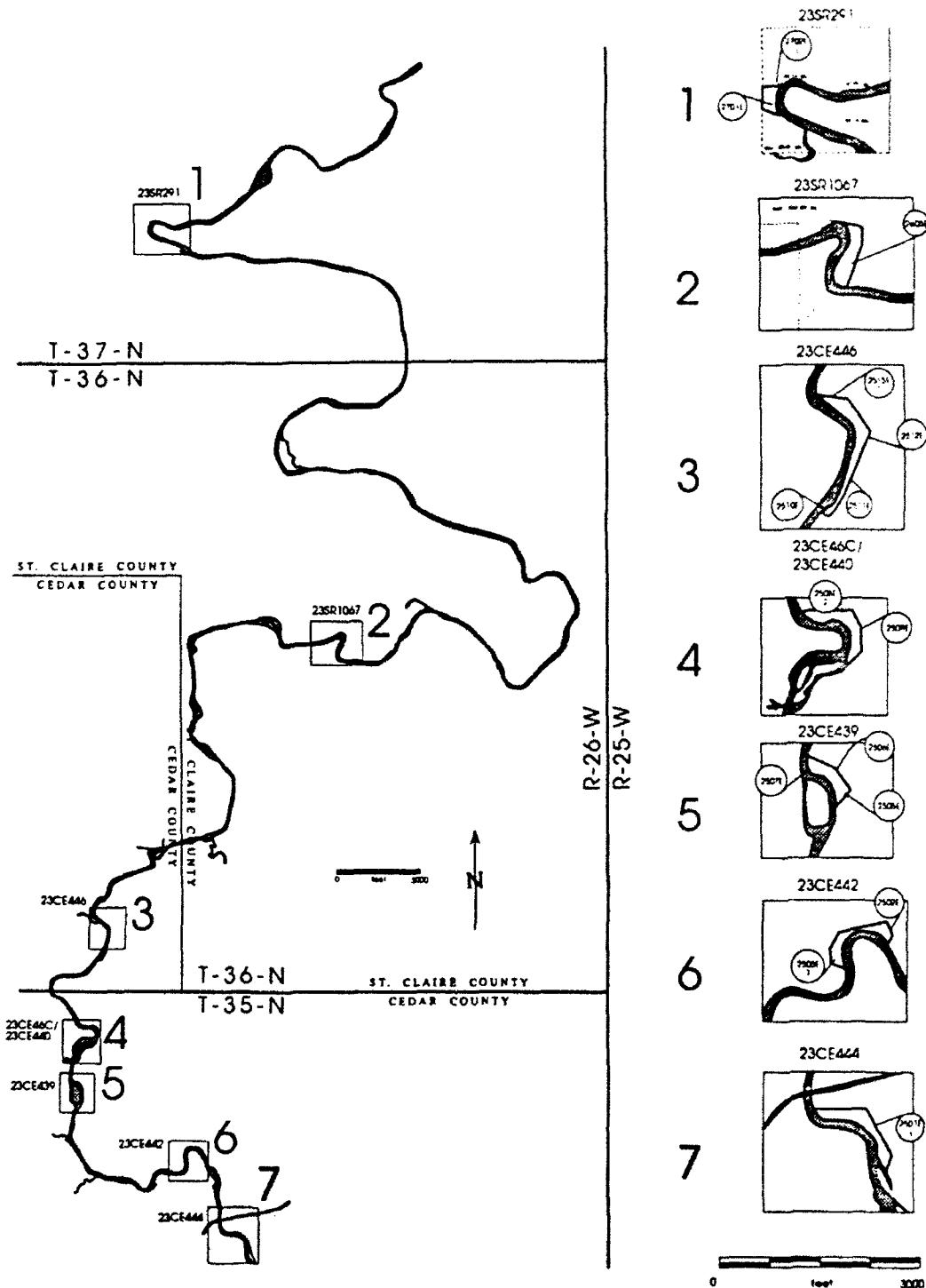


Figure 2. Location of the sites tested in the Sac Watershed.

ENVIRONMENTAL SETTING

Because archeologists study the physical remains of past cultures, it is often easy for us to focus on artifacts as an end in themselves. This is particularly true when they are unusually beautiful or well preserved, and is a natural outgrowth of the fact that artifacts comprise our basic data and must be dealt with before we can proceed with other studies. The real issues before us are not the cultural remains per se but the behaviors that produced them. These behaviors comprise the means by which people adapt to the physical and cultural environments in which they find themselves (Rappaport 1969:185). While other animals adapt to their surrounding environment through genetic mechanisms, people do so through genetic adaptation and by developing technological and behavioral strategies. These strategies and their accompanying technologies are closely related enough that, through the study of the physical remains, we can gain at least a partial understanding of past behavioral systems.

One important key to interpreting the remains of past cultures is an understanding of the physical environment that existed at the time. Basic assumptions underlying this are that technologies are closely related to the environment (Binford 1962:218) and that:

...similar technologies applied to similar environments tend to produce similar arrangements of labor in production and distribution, and...these in turn call forth similar kinds of social groupings, which justify and coordinate their activities by means of similar systems of values and beliefs [Harris 1968:4].

Our discussion focuses on the local environment as it exists today. While there are certainly pitfalls inherent in this approach, the Holocene environment has largely remained as we know it today with some notable exceptions.

The Sac River lies roughly at the boundary between the Ozark Highlands and the Osage Plains (Figure 3). The Ozarks are an elongated dome that encompass most of the southern half of Missouri. Major physiographic regions of the southwestern Ozarks include the Salem Plateau and the Springfield Plateau. The Salem Plateau is a maturely dissected upland surface composed of Cambrian and Ordovician rocks that has been substantially destroyed by streams that have cut valleys hundreds of feet deep (Vineyard 1967:13). The Springfield Plateau is underlain by Mississippian age rocks and rises slightly above the Salem Plateau. It slopes downward to the northwest and is an area of low relief where little of the old surface remains (Vineyard 1967:14). The Osage Plains are underlain by Pennsylvanian age sedimentary rocks and are characterized by low rolling relief (Vineyard 1967:14; Allgood and Persinger 1979; Anderson 1979; Haynes 1976).

Local geology is highly complex. Formations in and around the project area include the Ordovician age, Canadian Series Jefferson City Dolomite, the Mississippian age Osagean, Kinderhookian and Meramecian series and the Pennsylvanian age Atokan series. The Osagean Series includes the Burlington limestone and the Elsey, Reeds Spring and Pierson formations. The Kinderhookian Series includes the Northview, Compton and Bachelor formations. The Meramecian Series includes the St. Louis limestone and the Salem and Warsaw formations.

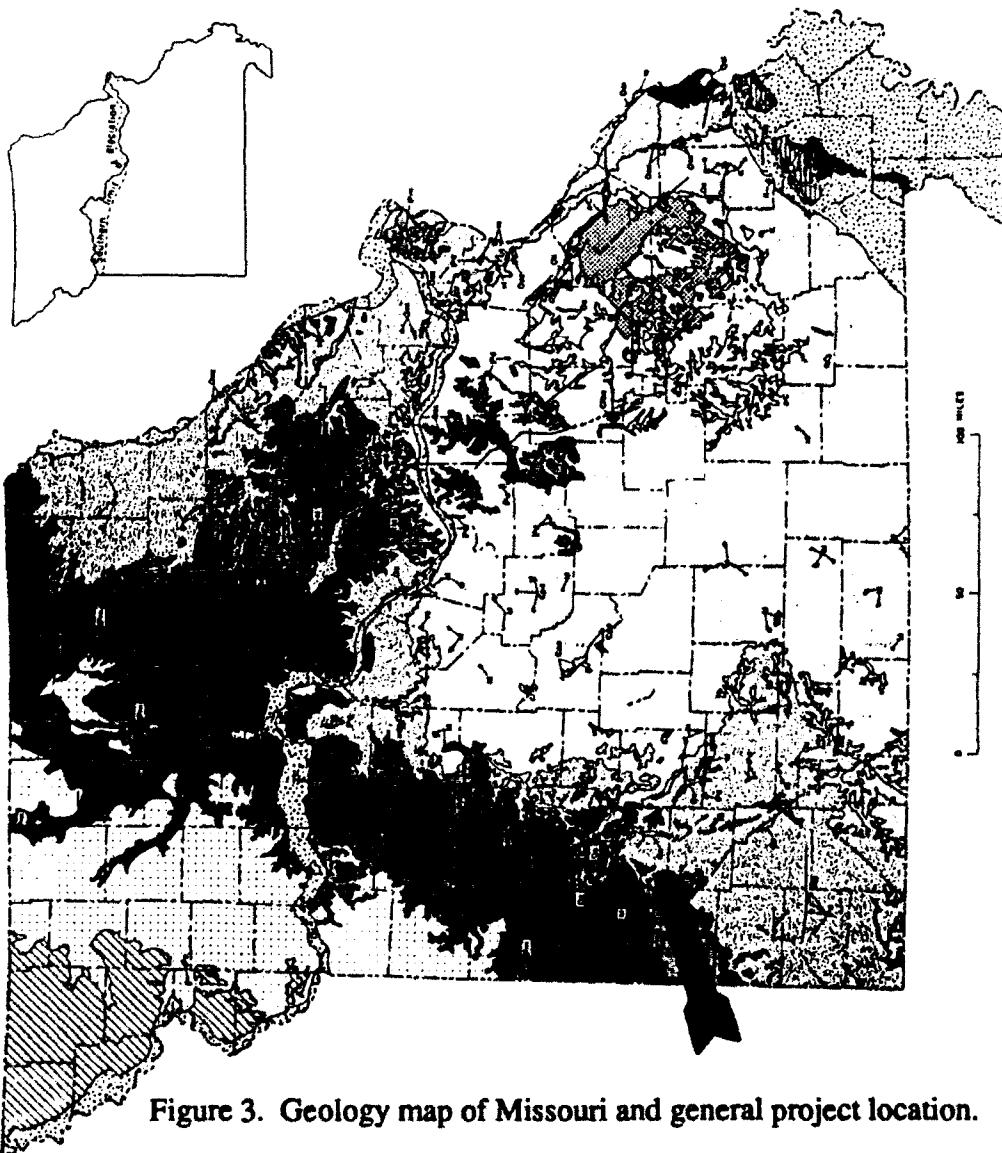


Figure 3. Geology map of Missouri and general project location.

EXPLANATION

	Quaternary Alluvium and Extent of glacial deposits
	Tertiary Paleocene, Eocene, and Miocene Series, Clay, sand, and gravel
	Cretaceous Late Cretaceous (Curtiss) Series; Sand and clay
	Mississippian Series Ouachita, Shawnee and Wabunee Groups; shale, lime- stone, sandstone, and minor coal. Includes a little sandstone of Permian age
	Devonian and Silurian Series Preston, Kansas City Limestone, and Peete Groups. Shale, limestone and dolomite, very minor coal
	Ordovician Series Chester and Marmaton Groups, includes some shale of the Meramec and St. Louis Groups; shale, sandstone, limestone, coal, and clay
	Cambrian Series Kinderhookian, Orogenic Meramecian, and Chesterian Series, probably mostly limestone shale, and dolomite
	Precambrian Limestone, dolomite, chert, and dolomite less than 10 subdivide at map scale
	Mesozoic Cherty limestone and dolomite St. Peter Sandstone near base and Maquoketa Shale near top
	Pennsylvanian Cherty dolomite with minor shales of the Gasconade Reefbeds, Jefferson City Collar, Pennell, and Smith- ville Formations
	Cenozoic Pebble and Equidens Dolomites, the Nodular has abundant bivalve shells
	Cenozoic Lamotte Sandstone, Spangler Formation, principally dolomite and Elvins Group, which are argillaceous dolomite
	Cenozoic Grano Limestone dolomite and sandstone, argillaceous dolomite

Vicinity floodplains are broad and level and, while little of the surrounding topography could be considered rugged, the river valley is well circumscribed by steep walls of dissected uplands that are 15 m to 50 m higher than the floodplain. Although generally level the valley is characterized by gently rolling floodplain topography and shows no evidence of land-leveling activity for agricultural purposes. Old meander scars are visible and some abandoned channels have formed oxbow lakes.

The Sac River originates in Greene County just west of Springfield, Missouri. It flows generally northward until reaching the Osage River. Tributaries in the project area include, from south to north, Cedar Creek, Turkey Creek, Moore Branch, Haynie Branch, Vilhauer Branch, Ladden Branch, Baker Branch, Cole Branch and Rattlesnake Branch. Of these, only Cedar Creek is a perennial stream. The remainder are intermittent streams with steep gradients that drain the uplands immediately above the Sac and rarely flow much further than one mile.

Both upland and lowland soils are included in the project area. The upland soils are shallow, rapidly drained and usually stony. The lowland soils are less well drained silty and clayey alluvium that contain little stone. St. Clair County has recently been mapped by the USDA Soil Conservation Service (Howard 1987) but Cedar County, where most of the sites tested are located, has not been mapped according to current soil classification schemes. The most recent published soil mapping for Cedar County (Watson and Williams 1911) is outdated and not useful for our purposes. Preliminary soil maps for the county were provided by the SCS office in Stockton (Table 1).

The Sac River lies roughly at the boundary between the Eastern deciduous forest and the western prairie. Shelford (1963:306) notes that:

In dry regions there is commonly a gradual transition at these contacts, with mixing of grass and woody plants. In moist regions, however, an abrupt change occurs from grassland to forest, and the assemblage of plants and animals is largely different from that of either grassland or forest. These forest-edge communities are in a state of constant fluctuation back and forth with changes in climate.

Topography east of the Sac is more dissected than to the west and the dominant vegetation is Oak-hickory forest. Major plants include white oak (*Quercus alba*), black oak (*Q. velutina*), post oak (*Q. stellata*), black jack oak (*Q. marilandica*), scarlet oak (*Q. coccinea*) and mockernut hickory (*Carya tomentosa*) with a lowbush blueberry (*Vaccinium vacillans*) understory predominating on acid soils and sugar maple (*Acer saccharum*), blue ash (*Fraxinus quadrangulata*), chinquapin oak (*Quercus prinoides* var. *acuminata*), walnut (*Juglans nigra*), papaw (*Asimina triloba*), linden (*Tilia americana*), deciduous holly (*Ilex decidua*), southern buckthorn (*Bumelia lycioides*) and other species on soils derived from limestone. Pignut (*Carya cordiformis*) and shellbark (*C. laciniosa*) hickories are intermixed with the oaks on deep soils (Sauer 1920:52-60; Shelford 1963:59; Steyermark 1963:xix-xx). Major animal species include turkey (*Meleagris gallopavo*), whitetail deer (*Odocoileus virginianus*), wolf, bobcat (*Lynx rufus*), bear (*Euarctos americanus?*), grey squirrel (*Sciurus carolinensis*), fox squirrel (*S. niger*), raccoon (*Procyon lotor*), opossum (*Didelphis marsupialis*), grey fox (*Urocyon cinereoargenteus*) and ruffed grouse (*Bonasa umbellus*). Snakes include the copperhead (*Agkistrodon contortrix*), the rough green snake (*Opheodrys aestivus*), the rat snake (*Elaphe flavigula*), the

coachwhip (*Masticophis flagellum*), the speckled kingsnake (*Lampropeltis getulus*), the cottonmouth moccasin (*Agkistrodon piscivorus*), coral snakes (*Micruurus fulvius*) and timber rattlesnakes (*Crotalus horridus*) (Shelford 1963:59-60).

Table 1. Soil data for the Downstream Stockton area.

Series	Texture	Slope	Drainage	Flooding	Natural Fertility.
Ashton	silt loam	0% - 2%	well	occasional	high
Cleora	fine sandy loam	0% - 1%	well	occasional	high
Cotter	silt loam	0% - 1%	well	rare	high
Hepler	silt loam	0% - 3%	poor	occasional	high
Lindside	silt loam	0% - 3%	well	common	high
Verdigris	silty clay loam	0% - 2%	well	occasional	high

Dominant vegetation west of the Sac is tall grass prairie on the level areas with stream-skirting forest in the drainages (Shelford 1963:330; Steyermark 1963:xviii-xxiv; Watson and Williams 1911:6-7). Dominant species include June grass (*Koeleria cristata*), blue grama (*Bouteloua gracilis*), side-oats grama (*B. curtipendula*), hairy grama (*B. hirsuta*), needle-and-thread (*Stipa comata*), green needlegrass (*S. viridula*), sheep fescue (*Festuca ovina brachyphilla*), little bluestem (*Andropogon scoparius*), buffalo grass (*Buchloe dactyloides*) and the animals bison (*Bison bison*), pronghorn (*Antilocapra americana*), badger (*Taxidea taxus*), jack rabbit (*Lepus* sp.). The cottontail (*Sylvilagus* sp.), wapiti (*Cervus canadensis*) and whitetail deer are secondary influents in areas having substantial stream-skirting forests.

Climate of Cedar and St. Clair counties is midcontinental with a yearly range in temperature extremes of 100°+ F (37° C) in the summer to -25° F (-4° C) in the winter (Howard 1987:78; Watson and Williams 1911:9). The average annual temperature is about 56° F (13° C) with 38 to 40 inches of precipitation, including 14 to 18 inches of snow. Rainfall is abundant, particularly during the spring and summer months. January is, on average, the coldest and driest month of the year but also receives about one third of the annual snowfall. June is the wettest month with an average of nearly 5 inches of rain, while July is the hottest month. The last spring frost usually occurs in mid to late April but may occur as late as early May. The first Fall frost normally occurs in mid to late October.

CULTURAL ENVIRONMENT

The prehistory of Missouri has been divided into the Early Man, Paleo-Indian, Archaic, Woodland and Mississippi periods (Table 2) (Chapman 1975, 1980; Wright 1987) and generally follows long established cultural divisions for the eastern United States. The Archaic, Woodland and Mississippi periods have been divided into early, middle and late periods as well. This discussion is not intended to be exhaustive but only to provide a framework for the results of this work.

Table 2. Prehistoric cultural sequence for the Western Prairie Region of Missouri
 (after Chapman 1975:230, 1980:264)

Cultural Period	Date Range	Comments
Late Mississippian	AD 1450 - AD 1700	Upper Osage
Middle Mississippian	AD 1200 - AD 1450	area used only by intermittent hunting and trading expeditions
Early Mississippian	AD 900 - AD 1200	Stockton complex; Steed-Kisker phase hunting parties (Dryocopus and Flycatcher sites, Forager Tradition?)
Late Woodland	AD 400 - AD 900	Boliver aggregate; Fristoe Burial aggregate; temporary campsites and burial mounds; Pomona Phase? Lindley Phase? Maramec Spring Phase?
Middle Woodland	500 BC - AD 400	temporary campsites of Hopewellian Interaction Sphere; Cooper complex; Forager Tradition may continue
Early Woodland	1000 BC - 500 BC	Forager Tradition continues in Stockton area
Late Archaic	3000 BC - 1000 BC	possible Forager component in Harrison shelter based on Table Rock Stemmed and Afton Corner Notched points and in Cat Hollow shelter based on Smith Basal Notched and Table Rock Stemmed; Munkers Creek phase and John Redmond Reservoir manifestation Kansas
Middle Archaic	5000 BC - 3000 BC	surface collections and tools probably from the Middle Archaic in proper sequence in Brounlee and Woody shelters
Early Archaic	7500 BC - 5000 BC	substantial Early Archaic component found at the Montgomery site.
Dalton	8500 BC - 7000 BC	possible use of shelter at 23BE108; deeply buried Dalton component found at Montgomery
Paleo-Indian	12,000 - 8000 BC	only a few Clovis Fluted and Folsom Fluted
Early Man	Pre-12,000 BC	no data

Early Man Period (pre-12,000 BC). Early Man is a speculative period that refers to stone age people having technology similar to Old World Paleolithic cultures. Percussion flaked crude bifaces, cobble tools and slightly modified flake tools were allegedly used by pre-Clovis peoples in the Americas (Chapman 1975:31-59; Wright 1987:C-1-1 - C-1-3). The well-made projectile points associated with Clovis and later cultures supposedly were not made by these peoples. The alleged Lively Complex of Alabama (Josselyn 1965) and Byran's (1965) pre-projectile point periods are examples of Early man manifestations. There is little agreement regarding the age or even existence of Early Man sites in North America (Meltzer 1989:471:490). Those who accept that people were present in North America have estimated their arrival at anywhere between 100,000 and 12,500 years ago. Most estimates are in the 25,000 to 40,000 year range based on the timing of glaciation episodes and the exposure of a land bridge across the Bering Strait. Population densities would have been very low and the archeological record concomitantly scanty. No Early Man sites have been proposed for the Osage Prairie Study Unit.

Paleo-Indian Period (12,000 - 8000 BC). Cultures of this period are generally characterized a nomadic hunting and gathering bands that subsisted primarily by exploiting Late Pleistocene megafauna (Chapman 1975:60-94; Wright 1987:C-2-1 - C-2-3). These Big Game Hunters, as they are known, undoubtedly exploited a wide range of other floral and faunal resources with a broader technology than is commonly preserved at sites of this age. We would expect them to have employed a range of bone and wooden tools along with the stone tools that are normally the only surviving evidence. The hallmark of Paleo-Indian culture is the fluted projectile point, many of which have been recovered but few in good context. Fluted points

have been found in the Osage Prairie Study Unit but no Paleo-Indian sites have been recorded. Although the Paleo-Indian Period is the first well-documented human occupation of North America, we know little of these peoples beyond their lithic technology.

Dalton Period (8500 - 7500 BC). The Dalton Period (Chapman 1975: 95-126; Wright 1987:C-3-1 - C-3-4) is the first wide-spread cultural manifestation and sites yielding Dalton Period artifacts are far more common than the preceding Paleo-Indian. It is generally regarded as transitional between the Paleo-Indian and Archaic periods, although some consider it to be terminal Paleo-Indian. Chapman notes that the Dalton Period marks the transition from free-wandering big game hunting to hunting and foraging, probably as a result of changing climatic conditions that brought about the extinction of the Pleistocene megafauna and an end to the lifeway that depended upon them. The hallmark of the Dalton Period is the Dalton projectile point or knife. Other tools appeared along with artifacts useful in hunting. Tools for working wood - adzes, spokeshaves and steep-edged scraping and cutting tools - suggest the manufacture of wooden implements possibly useful in procuring small game or other non-game resources. Faunal remains recovered from the Dalton levels at Graham Cave (23MT2) indicate a dependence on cottontail rabbit, raccoon, squirrel and whitetail deer (Logan 1952:63). The addition of milling and pulverizing tools indicates that vegetal resources such as nuts and seeds were becoming more important. In addition, bone awls and needles have been recovered from dry caves, giving some insight into the non-lithic technology employed by these peoples. Dalton activities at a depth of 3.3 m below surface have been documented at the Montgomery site (23CE261) located on the Sac River a short distance from Stockton Dam. It was recorded by Roper (1977) in 1976, later tested by Collins et al. (1983) and is now listed on the National Register of Historic Places.

Early Archaic Period (7500 - 5000 BC). The Early Archaic Period (Chapman 1975:127-157; Wright 1987:C-4-1 - C-4-5) marked an increased shift toward foraging and the exploitation of aquatic resources with wiers, traps, nets and spears. The chipped stone tool technology no longer included fluting and new forms emerged. These included lanceolate points with concave bases and heavily ground edges (Dalton Serrated, Rice Lanceolate, Rice Contracting Stemmed, Rice Lobed) and large points with straight or contracting stems (Eden, Scottsbluff, Alberta). Other chipped tools included snubbed-end flake scrapers, round scrapers and scrapers made of broken projectile points. Projectile points were also reworked into drills. Milling and pulverizing tools, useful for processing plant resources continued to be used. Chapman (1975:130) notes that Early Archaic sites are virtually unknown in the area and none are associated with extinct megafauna. The Montgomery site (Collins et al. 1983) yielded numerous Early Archaic point types including Graham Cave, Cache River, Scottsbluff, Holland, Plainview, Agate Basin, Angostura, Hardin, Hardaway Side-Notched, Rice Lobed, Big Sandy, Golondrina, Wheeler, and a variety of other points that exhibited similar forms but could not be classified with confidence. Other materials included flake tools, cores, hammerstones, drilled stones, drills and miscellaneous lithic debris. A radiocarbon date of 7850 BC was obtained from a small tree trunk or branch embedded in the cutbank, but not in direct association with any cultural remains.

Middle Archaic Period (5000 - 3000 BC). During the Middle Archaic Period (Chapman 1975:158-183; Wright 1987:C-5-1 - C-5-4), the climate of North America was markedly drier.

Human adaptation to these conditions, which fostered the expansion of prairie environments, included increased reliance on a wide variety of small game animals and collecting vegetal foods but apparently did not result in fundamental shifts in settlement and subsistence activities. Side-notched projectile points (Raddatz, Black Sand, Big Sandy, White River Archaic) became common and new tools were introduced, including the full-grooved ground stone axe, the celt (an ungrooved ground stone axe), a variety of twined fabrics and cordage, bone and shell ornaments and bone and antler tools. Other common artifacts include corner-notched and contracting-stemmed points, scrapers, pitted cobbles and choppers. Chapman characterizes the period as one of diversity rather than specialization. Middle Archaic components are present at 8 sites along the Sac River downstream from Stockton Dam including 23CE227, 23CE237, 23CE242, 23CE253, 23CE261, 23CE262, 23CE411 and 23CE417 (Schmits 1988:32-36; Collins et al. 1983:36-37, 88).

Late Archaic Period (3000 - 1000 BC). Climate during the Late Archaic Period (Chapman 1975:184-224; Wright 1987:C-6-1 - C-6-6) continued to be dry through about 2000 BC. Primary reliance continued to be placed on plant gathering over hunting. It was also during this time when some of the earliest cultivation of tropical plants occurred at Phillips Spring (Chomko and Crawford 1978; Kay 1980). New tools included the Clear Fork Gouge and the Sedalia Digger. The first may have been used for pulverizing roots or the cambium layers of trees, while the second characteristically exhibits gloss from digging. Grinding and pulverizing implements, such as manos, pestles and hammerstones, were common, as were large flaked knives, such as Etley Stemmed, Sedalia Lanceolate and Stone Square-Stemmed. Typical point types include Nebo Hill, Smith Basal Notched, Table Rock Stemmed, Big Sandy Notched, Afton and contracting-stemmed types. Items associated with hunting such as flake scrapers, flake knives and dart points are less common than in previous periods. Late Archaic components downstream from the Stockton Dam have been identified at 18 sites, including 23CE14, 23CE223, 23CE227, 23CE234, 23CE240, 23CE242, 23CE243, 23CE248, 23CE250, 23CE253, 23CE255, 23CE258, 23CE259, 23CE401, 23CE404, 23CE408, 23CE409 and 23CE410 (Schmits 1988:32-36).

Early Woodland Period (1000 - 500 BC). The appearance of Woodland cultures is usually marked by mound construction and the addition of pottery to the technology, however, that does not seem to have been the case in this part of Missouri (Chapman 1980:9-20; Wright 1987:C-7-1 - C-7-3). Whether this is due to the abandonment of the area during this period, tardiness in the adoption of new lifeways and technologies, or use of the area in ways that did not require pottery (such as at specialized activity sites) is not well understood. The problem that this creates, of course, is that, if defining Early Woodland sites depends on the presence of pottery in a place where the inhabitants did not use pottery, recognizing sites dating to this period becomes extremely difficult. Projectile point types are marginally useful since none are exclusively affiliated with the Early Woodland. The problem can be readily seen in the Schmits (1988:32-36) inventory of Sac River sites and the Nichols (Nichols et al. 1980:3-2 - 3-9, A-2 - A-3) inventory of Stockton Lake sites where 45 Woodland components are listed for Cedar County, none of which is Early Woodland. The consensus appears to be that peoples living in the area during this period still followed an Archaic lifeway.

Middle Woodland Period (500 BC - AD 400). The Middle Woodland Period (Chapman 1980:21-77; Wright 1987:C-8-1 - C-8-7) has been defined on the basis of traits associated with the Hopewell. These include permanent village settlements, the introduction of pottery, mound construction, the beginning of maize cultivation, trade in exotic items from distant places. Projectile points are ovate corner-notched (Mankers and Snyders) and subtriangular corner-notched (Ansell and Steuben). Ceramics are sand or grit-tempered with decorative techniques that include punch and boss, roulette, dentate stamp and cross-hatching.

Other diagnostic artifacts include clay figurines, stone platform pipes, celts, stone hoes, adzes, oval and circular scrapers and flake blades. Exotic items include copper, silver, obsidian, marine shell, shark's teeth, sheet mica, meteoric iron and bear teeth. In Missouri, there are 3 clusters of Hopewell activity: The Kansas City Center, the Big Bend Center in central Missouri, the Cooper Center in southwest Missouri. Other Middle Woodland phases include the Central Valley and Monroe phases in northeast Missouri, and the Burkett, Barnes Ridge and Ten Mile Pond phases in southeast Missouri. No Middle Woodland phases have been defined for the Sac River Valley. Sites in the project vicinity that have yielded Middle Woodland materials include an unidentified cave in St. Clair County, Rockhouse Cave, Taterhole Cave, Griffin Shelter, 23CE411 and 23CE417.

Late Woodland Period (AD 400 - AD 900). The Late Woodland Period (Chapman 1980:78-137; Wright 1988:C-9-1 - C-9-10) witnessed the decline of Hopewell culture and the provincialization of Woodland society. The far flung trade networks no longer functioned and ceremonialism declined. Settlements were more dispersed and areas not previously inhabited were now occupied on at least a semi-permanent basis. Subsistence systems had less emphasis on gardening and specialized resource procurement in favor of more generalized foraging. The artifact inventory was largely the same as the Middle Woodland except for the inclusion of arrow points and plain and cordmarked ceramics with simple decorations such as scalloping, notching, punctating or impressing applied to the lip. Tempering agents included principally clay, grit and limestone. Sites in the project area assigned to the Late Woodland Period include Dryocopus (23CE120), Flycatcher (23CE153), Shady Grove, 23CE123, 23CE241, 23CE406 and 23CE412.

Work conducted in the Stockton Reservoir during the 1960s resulted in the establishment of the Bolivar Burial Complex (Wood and Brock 1984). Excavations were conducted at 9 mounds including Umber Point (23CE148), Sorter's Bluff (23CE150), Bowling Stone (23CE152), Sycamore Bridge (23CE154), Tunnel Bluff (23DA222), Bunker Hill (23DA225), Divine (23DA226), Paradise Tree (23DA246) and Slick Rock (23PO306). These mounds ranged in size from 5 m to 7 m in diameter, 15 cm to 91 cm in height and contained the remains of 3 to 18 individuals. Two contained dog burials as well. Artifacts included limestone, grog and shell-tempered ceramics; Scallorn, Young, Fresno, Harrel and Reed arrow points; Rice Side-Notched and Cupp dart points; drills, scrapers, various flake tools, celts, milling implements, bone and antler tools; *Anculosa*, *Marginella*, *Oliva* and periwinkle beads; mussel shell disk beads; conch shell disk beads, pendants, rings and gorgets. Vegetal remains included maize, squash, sunflower, Marshelder, Chenopodium, hickory nuts, hazelnuts, acorns, walnuts, mulberry and dogwood.

Radiocarbon dates were AD 390 ± 140 (Bowling Stone), AD 1000 ± 120 (Umber Point), 1090 ± 100 (Sorter's Bluff), AD 1110 ± 75 (Divine) and AD 1465 ± 90 (Divine). Thermoluminescence dates were AD 953 ± 49 (Bunker Hill), AD 1085 ± 49 (Bunker Hill), AD 1307 ± 30 (Slick) and AD 1580 ± 30 (Slick).

Wood and Brock (1984) placed the complex in the Late Woodland Period because the majority of the ceramics were limestone tempered. Chapman (1980:150-152) places the complex in the Early Mississippi Period on the basis of the radiocarbon dates. Open campsites dating to the period have been investigated at Dryocopus Village (23CE120), Flycatcher (23CE153) (Calabrese et al. 1968, 1969; Pangborn et al. 1971) and Shady Grove (Ward 1968). These sites contained circular and oval post-in-ground structures and yielded lithic assemblages that Chapman (1980:86) feels place them in the Late Woodland or Early Mississippi periods (ca AD 1000). No ceramics were recovered. Radiocarbon dates of AD 1485 ± 100 at Dryocopus Village and AD 715 ± 95 and AD 1390 ± 100 at Flycatcher, however argue for a Middle Mississippi Period affiliation. It is possible that sites like Flycatcher and Dryocopus, which are roughly contemporaneous with the various burial mounds in the area, may have been occupied by peoples returning to their ancestral homeland to bury the dead.

Early Mississippi Period (AD 900 - AD 1200). The Early Mississippi Period (Chapman 1980:138-227; Wright 1988:C-10-1 - C-10-8) marked the advent of organized village life. Classic Mississippi Period cultures in the major river valleys were characterized by fortified planned civic ceremonial centers having mounds arranged around a plaza. These centers were surrounded by outlying villages, farmsteads and specialized activity loci where specific resources were exploited. Subsistence centered around the cultivation of tropical plants such as corn, beans and squash with organized exploitation of a wide variety of natural resources. Diagnostic artifacts include shell-tempered ceramics and a variety of arrow points, particularly triangular forms. The Early Mississippi Period occupation in the project area does not fit the classic mold, however. The Stockton Burial complex, which is has been identified at a number of sites in the area, including Madrigal Mound, Petit Cote Cairn, King's Curtain Mound, Amity Mound, Albert Mound, Matthews Mound, Cordwood Cairn, Eureka Mound and shelters at 23DA241, 23DA300, 23DA301, 23DA302, 23DA303, the Vance site, Tater Hole Cave, Toler Cave, Buck's Cave, Gray Shelter, Harrison Shelter, Elmer Long Shelter and Gannaway Cave (Wood 1965:130; Chapman 1980:150). The mounds and cairns of the complex are located on hilltops overlooking the major stream valleys. The mounds are 6 m - 8 m in diameter, less than 1 m high and constructed with earth and rock fill. A variety of burial types were present, including cremations, extended, flexed, bundle burials and scattered bones, both burned and unburned. Associated artifacts included plain and cord marked shell-tempered ceramics, Huffaker Notched and Cahokia Notched arrow points, chert knives, conch shell beads, effigy elbow pipes, bone fishhooks, pulley type ear spools, and strip and antler bracelets. Other artifacts, also associated with other complexes, included Mississippi Triangular, Scallorn Corner Notched, Reed Side Notched and Crisp Ovate arrow points; *Anculosa* and *Marginella* shell beads, conch shell disk beads; bone awls; Rice Side Notched; Cupp Corner Notched; and large triangular or oval cutting implements. Chapman feels that the primary contributors to the complex were peoples of the Gibson Aspect and the Steed-Kisker phase, based on of pottery types found in the caves and shelters.

Middle Mississippi Period (AD 1200 - AD 1450). The Middle Mississippi Period (Chapman 1980:228-261; Wright 1988:C-10-1 - C-10-8) was largely an elaboration of trends begun in the Early Mississippi Period and represents the florescence of Mississippi culture. Population expanded, as did the territory under the control of the various civic-ceremonial centers. In the project vicinity, no sites ascribable to the Middle Mississippi Period are known. This is due to an artifact assemblage that is largely identical the Early Mississippi Period and that the area appears to have been used primarily for hunting forays.

Late Mississippi and Protohistoric Period (AD 1450 - AD 1700). Chapman does not discuss the Late Mississippi Period, noting that it includes protohistoric and historic groups that were to be discussed in a future publication (Chapman 1980:138). We know from the accounts of the De Soto expedition of 1541 that Late Mississippi cultures in the Mississippi Valley were highly organized agrarian-based societies capable of fielding formidable fighting forces. When French explorers arrived, 130 years later, the area had apparently been largely depopulated and the large towns abandoned, possibly the result of introduced epidemic diseases to which the native peoples had no immunity (Morse and Morse 1983:305-315).

Historic Period (AD 1541 - present). Immigrants from Kentucky, Tennessee, Virginia, Illinois, Indiana and Ohio were among the first to settle the Missouri Highlands during the 1820s - 1840s (Goodspeed 1889; Rafferty 1982). By the late 19th century these frontier settlers began a transformation from subsistence farming to more diversified crop and fruit production (Abbott and Hoff 1971). The economy of the area continued to improve from the turn of the century through World War II. Buildings and roads were built throughout the area to support the boom in the farming, mining, oil and tourist industries (Abbott and Hoff 1971:96). Dairy farming was soon transformed to feeder cattle production and forests of the region were cut for timber and cleared for pastures (Girard and Freeman 1984:33).

PREVIOUS INVESTIGATIONS IN THE PROJECT VICINITY

The earliest known professional investigations in the immediate vicinity occurred in the early 1960s before the construction of Stockton Dam. An initial survey was conducted by the University of Missouri (UMAAD) and resulted in the recording of 40 sites (Chapman et al. 1962, 1963). Excavations were conducted at 3 mound sites and 3 shelters. Subsequent excavations continued until 1967 (Calabrese et al. 1969; Wood 1965, 1966) that clarified the local cultural sequence and defined the Bolivar Burial Complex (Wood and Brock 1984). Work at 3 floodplain sites - Dryocopus Village, Flycatcher (Calabrese et al. 1968, 1969; Pangborn et al. 1971) and Shady Grove (Ward 1968) - in the area produced information on the nature of non-mound sites spanning the transition from Woodland to Mississippian culture.

After a hiatus in archeological work of about ten years, the Kansas City District awarded a contract to the University of Missouri for the survey of COE controlled lands along the Sac River downstream from the Stockton Dam (Roper 1977). This survey encompassed 9 km², equal to about 45% of the Sac River Valley, between the Stockton Dam and Caplinger Mills. Forty of the 44 sites reviewed were newly recorded. Cultural components identified included Dalton (1),

Middle Archaic (6), Late Archaic (8), Early (?) Woodland (7) and Middle/Late Woodland (9). It is worth pointing out that since none of the sites yielded pottery, some of the Woodland sites that yielded arrow points could be either Woodland or Mississippi in affiliation. Roper (1977:97-99) concluded that the Sac River Valley has been more or less continuously occupied since Dalton times but has been used differently by different cultures. Middle Archaic peoples established base settlements on the floodplain with small specialized activity sites located next to the river. Late Archaic peoples established two kinds of limited activity sites including those near the river and those at the base of the valley wall. Woodland peoples early on established both base camps and limited activity sites but later did not establish permanent occupations. Limited test excavations were also conducted at Montgomery (23CE261) which exhibited a deeply buried Dalton occupation.

Test excavations at 23CE235, 23CE252 and 23CE324 were conducted by the Center for Archaeological Research (CAR), Southwest Missouri State University in 1981 (Perttula and Purrington 1983). CAR had planned to conduct excavations at 23CE240, 23CE241 and 23CE242 as well but landowner permission could not be secured for work at these sites. 23CE252 proved to be a single component Woodland Period site that exhibited good integrity but was limited to the upper 15 cm - 20 cm. 23CE235 was found to be a Woodland Period limited activity site that was restricted to the plowzone and exhibited substantial evidence of damage from erosion. 23CE324 was found to be a probable hunting camp occupied during the Woodland Period that exhibited shallow deposits.

Work at Montgomery (23CE261) was undertaken in 1976 (Collins et al. 1983). Previous limited testing had indicated that deeply buried in situ deposits were present at the site but, since no culturally diagnostic artifacts were recovered, possible cultural components present could only be guessed at, based on the site's vertical location. Abundant evidence of Dalton and Early Archaic activities at the site was recovered, as well as a single Middle Archaic Big Sandy point that was recovered from the river but thought to be from the site. The major occupation occurred at a depth of 2.4 m and exhibited discrete horizontal clustering that indicated that activity areas have been preserved at the site.

In late 1984 and early 1985, American Resources Group (ARG) conducted a survey of COE slough easements downstream from the Stockton Dam (Moffat and Houston 1986). Approximately 400 acres were surveyed and 27 sites and 4 isolated artifacts were located. Test excavations were conducted at 12 of these sites as well as 3 previously recorded sites added by the Kansas City District. Sites tested included 23CE14, 23CE255, 23CE256, 23CE401, 23CE403, 23CE405, 23CE406, 23CE408, 23CE410, 23CE412, 23CE417, 23CE418, 23CE419, 23CE420 and 23CE421. Cultural components identified included Early or Middle Archaic (1), Late Archaic (8), Middle Woodland (2), Late Woodland (5), indeterminate Woodland (14), indeterminate Mississippi (1), indeterminate prehistoric (5) and a historic mill (1). Nine sites were found to be eligible for inclusion in the National Register including 23CE14, 23CE255, 23CE401, 23CE406, 23CE408, 23CE410, 23CE417, 23CE419 and 23CE420.

In 1986 the Kansas City District issued a contract to Environmental Systems Analysis (ESA) for the survey of an additional 148 acres of slough easements and assessment of 18 prehistoric sites including 14 previously recorded sites (23CE52, 23CE226, 23CE227, 23CE229, 23CE230, 23CE238, 23CE239, 23CE242, 23CE245, 23CE253, 23CE258, 23CE262, 23CE263 and 23CE409) and 4 newly recorded sites (23CE423, 23CE425, 23CE426 and 23CE427). Cultural components identified included Dalton (1), Middle Archaic (6), Late Archaic (9), Late Woodland (11), indeterminate Woodland (2), indeterminate prehistoric (2) and historic (1). A historic bridge (23CE424) was not assessed. Six sites (23CE226, 23CE229, 23CE238, 23CE409, 23CE426 and 23CE427) were determined to be eligible for inclusion in the National Register and an additional 6 (23CE52, 23CE227, 23CE230, 23CE253, 23CE258 and 23CE425) were found to be potentially eligible.

In 1987 the ESA contract was modified to provide for the survey of 22 additional Corps easements beginning at Caplinger Mills and continuing downstream nearly to the confluence of the Sac and Osage rivers. This work was conducted in 1988. Previously recorded sites that were revisited included 23CE46C and 23SR291. Newly recorded sites included 23CE437, 23CE438, 23CE439, 23CE440, 23CE441, 23CE442, 23CE443, 23CE446, 23SR1059, 23SR1060, 23SR1067 and an unidentified newly recorded site found in Tract 2603E. One previously recorded site (23SR1049) was thought to be located in Tract 2604E and could not be relocated. Little is known of these sites since no report was required.

PREVIOUS INVESTIGATIONS AT THE SITES IN THIS STUDY

Seven floodplain prehistoric archeological sites (23CE46C, 23CE439, 23CE440, 23CE442, 23CE444, 23SR1067 and 23CE446) and one talus slope (23SR291) site were assessed to determine their significance relative to National Register of Historic Places criteria. None of these sites had been previously tested and were known only from surface surveys and inspection of subsurface deposits exposed along the river bank. With the exception of 23CE46C and 23SR291, all of these sites were recorded during the 1986 survey conducted by ESA (Table 3).

23CE46C was revisited by James Donohue and Larry J. Schmits who assigned it the field number ESA-9. It is located on a first terrace of the Sac River at an elevation of 750 ft in COE Real Estate Tract 2508E2. Donohue and Schmits characterize it as a medium density surface scatter that occupies an area of 20,824 m² in an agricultural field. They also observed a medium density of lithics eroding from the high cutbank of the meander loop, indicating the presence of a deeply buried deposit. No evidence was recovered to enable a determination of cultural affiliation or specific activities that may have been conducted at this location. No data on site depth were recovered because controlled excavations were not part of the investigations.

23CE437, 23CE438 and 23CE439 were grouped as a single site (23CE439) by the Kansas City District for purposes of this study because of their proximity. 23CE439 was recorded by James Donohue and Larry J. Schmits during the 1986 survey and assigned the field number ESA-7. It is located on a high terrace bench at an elevation of 775 ft in a cultivated field in COE Real Estate Tracts 2505E and 2506E. Donohue and Schmits characterize it as a

moderate to dense lithic scatter that occupies about 59,500 m² on a high T1b terrace (Rogers alluvium) next to the Sac River. Artifacts were observed in a cultivated field, extending into a wooded area along the river bank.

Table 3. Basic site data before HPA assessments.

Site	Affiliation	Function	Size	Depth	Integrity
23CE46C	unknown prehistoric	unknown	20,824 m ²	1 m	unknown
23CE437	unknown prehistoric	unknown	unknown	buried deposit at 2.9 m - 3.1 m	unknown
23CE438	unknown prehistoric	unknown	unknown	buried deposit at 4.5 m	unknown
23CE439	unknown prehistoric	unknown	59,500 m ²	unknown	unknown
23CE440	unknown prehistoric	unknown	unknown	buried deposit at 3.5 m - 3.9 m	unknown
23CE442	unknown prehistoric	unknown	unknown	buried deposit at 2.2 m	unknown
23CE443	unknown prehistoric	unknown	unknown	buried deposit at 2.2 m	unknown
23CE444	unknown prehistoric	unknown	47,085 m ²	surface, buried deposit at 2.3 m	unknown
23CE446	unknown prehistoric	unknown	unknown	surface, buried deposit at 4 m	unknown
23SR291	unknown prehistoric	unknown	120 m ²	surface	unknown
23SA.067	Late Archaic, Early Woodland	unknown	unknown	1 m	unknown

23CE440 was recorded by Michael R. Fosha and Larry J. Schmits during the 1986 survey and assigned field number ESA-8. Located a short distance up stream from 23CE46C in COE Real Estate Tracts 2508E2 and 2509E, this site could be seen eroding from a T1 deposit buried 3.5 m to 3.9 m below the surface (set at the 750 ft contour) with flakes and a scatter of debris extending for 100 m. No evidence was recovered to enable a determination of size, cultural affiliation, or specific activities that may have been conducted at this location. Because the site is deeply buried and controlled excavations were not part of the investigations, no data on site size or depth were recovered. Since the site was recorded, the Sac River has meandered eastward, destroying the portion in Real Estate Tract 2508E2. Landowner permission could not be obtained to work in Real Estate Tract 2509E.

23CE442 and 23CE443 were also grouped by the Kansas City District because of their proximity. Both were found eroding from the Sac River cutbank at 2.2 m below the surface. 23CE442 was recorded in COE Real Estate Tract 2502E by James Donohue and Larry J. Schmits during the 1986 survey and assigned field number ESA-2. They characterized the site as lithic debris from a buried T1 deposit eroding from the cutbank approximately 2.2 m below the present surface that is at an elevation of 750 ft. No evidence was recovered to enable a determination of size, cultural affiliation, or specific activities that may have been conducted at this location.

23CE444 was recorded in COE Real Estate Tract 2501E1 by Michael R. Fosha and Larry J. Schmits during the 1986 survey and assigned field number ESA-1. They describe the site as a moderately dense surface scatter of lithics on a first terrace of the Sac River with a second component eroding from the river bank approximately 2.3 m below the surface that is at an elevation of 750 ft. The site occupies an area 60 m x 250 m in a cultivated field but may extend into an adjacent wooded area. No evidence was recovered to enable a determination of cultural affiliation or specific activities that may have been conducted at this location.

23CE446 was recorded in COE Real Estate Tract 2511E by Jim Donohue and Larry J. Schmits during the 1986 survey and assigned field number ESA-14. They describe the site as a moderately dense surface scatter with a buried component composed of charcoal and burned clay eroding into the river at a depth of 4 m below surface. No evidence was recovered to enable a determination of size, cultural affiliation or specific activities that may have been conducted at this location.

23SR291 was first recorded by University of Missouri, Columbia archeologists Chomko, Cantley and Fulda on July 22, 1975. They described it as a rocky ledge about 400 m in extent with caves on a slope between the 740 ft and 760 ft contours, containing debitage, bone and shell. During the 1986 survey, the site was revisited by Michael R. Fosha and Larry J. Schmits. They noted bone and shell eroding into the Sac River from an apparent surface deposit occupying approximately 120 m² of a talus slope east of Rockhouse Cave (23CE21). The surface scatter indicated that artifacts extend past the rock ledge onto the lower terrace. They assigned it field number ESA-12, an extension of 23SR291, and listed the site as located in COE Real Estate Tracts 27051 and 270E2. No evidence was recovered to enable a determination of size, cultural affiliation or specific activities that may have been conducted at this location. The site was revisited again on November 13, 1989 by COE archeologist Bob Zigler of the Kansas City District. He noted the presence of lithics on the surface of the lowest river terrace and in the upper 30 cm of the exposed cutbank southeast of Rockhouse Cave. He also noted, however, that the cutbank in which 23SR291 was exposed did not appear to be within a COE easement. Our review of the site form submitted by ESA revealed that the legal description placed the site south of Rockhouse Cave, rather than east of it, as Schmits had described. The plotted location and legal description of 23SR291 placed it in Real Estate Tract 2702E-1 and possibly Real Estate Tract 2701E as well although the location description suggested that the site was slightly downstream.

23SR1067 was recorded by Michael R. Fosha and Larry J. Schmits during the 1986 survey in COE Real Estate Tract 2603E and assigned field number ESA-13. At that time, artifacts were observed eroding out of the Sac River cutbank approximately 1 m below the surface for a distance of about 300 m. Artifacts present at the site indicated a Late Archaic and/or Early Woodland Period habitation site. No data on site size were recovered because the ground surface was covered with pasture and the site was buried.

RESEARCH CONSIDERATIONS

Definition of Site Limits. Restriction of the investigations to Government easements sometimes required basing assessments on small parts of a given property since some were located mostly on private lands. Our goal was to conduct excavations that would encompass no more than .001% of the government controlled portions, but with no fewer than 4 m² excavated at small properties and no greater than 16 m² at larger ones. Unexcavated volume was applied to another property where fewer than 4 m² were required to assess any given site.

Location Problems at 23SR291 and 23CE46C. It was not known if any part of Rockhouse Cave (23SR21) was in the project easement although it appeared from the existing records that it was not. The Scope of Work did not require investigations at 23SR21 and none were anticipated. Boundary questions at 23SR291 focused on the talus deposits down slope from 23SR291. This unstable surface may or may not have been used by the prehistoric inhabitants of 23SR291. Initial documentation of whether it was used was established by an intensive review of the surface in combination with posthole, auger and/or shovel tests. It was recognized that 23SR291 may be outside the project area. A similar approach was taken at 23CE46C where evidence of past activities was limited to surface and near surface contexts. Property boundaries inside the easements were established by a review of the surface along with documented posthole, auger and/or shovel tests.

23CE440, 23CE442 and 23SR1067. These properties presented difficulties in establishing vertical and horizontal boundaries since they are at depths generally beyond the reach of standard shovel and posthole testing. Boundaries for these properties were determined by auger testing, intensive review of bank profiles and backhoe trenching. Auger tests were conducted in controlled levels and documented by soil color, texture and artifact content. Backhoe trench profiles will be cleaned, inspected and documented as required to gain a clear understanding of vertical and horizontal extent. As with 23SR291 and 23CE46C, all investigations were limited to the government controlled areas of each property.

23CE439, 23CE444 and 23CE446. These properties presented special problems in establishing vertical and horizontal boundaries since some had both surface and subsurface components. Establishing horizontal extent of surface deposits was accomplished by controlled surface collections and shovel testing. The problems arise from assuming that the subsurface deposits mirror that reflected by the surface evidence and we could not assume a perfect fit for the entire vertical profile. This was complicated by the fact that deeper deposits are generally beyond the reach of standard shovel and posthole testing. Boundaries for these levels were determined by auger testing, intensive review of bank profiles and backhoe trenching. Auger tests were conducted in controlled levels and documented by soil color, texture and artifact content. Backhoe trench profiles were cleaned, inspected and documented as required to understand vertical and horizontal extent.

Testing Methods. Six properties have documented buried cultural strata. 23CE440, 23CE442 (which includes 23CE443) and 23SR1067 have deposits ranging from 1.0 m to 3.9 m below surface. 23CE439 (which includes 23CE438 with artifacts 4.5 m below surface and 23CE437 with artifacts 3 m below surface) has the deepest known deposits of this group of properties and 23CE444 and 23CE446 have both surface and subsurface deposits of unknown depth. Testing was aimed at providing basic cultural-historical, contextual and environmental data for each historic property. Methods applied to all work included:

- A temporary datum was established at each property and identified on a scaled plan map. Mapping and all measurements were accomplished with metric tapes and transit. Controlled surface collections of prehistoric artifacts were made where possible.

- Test units were excavated to culturally sterile soil or rock surfaces and all units were backfilled. Subsurface units were excavated in natural levels or as required in 10 cm levels. Cultural matrix was screened through $\frac{1}{4}$ inch mesh hardware cloth. At least one fine screen sample was collected from every feature or clear cultural level for the recovery of faunal, floral, pollen and soils data. Features were excavated and documented in halves.
- Work was documented with black-and-white photos and (where necessary) color slides. Notes were maintained on each test unit (including shovel, posthole, auger and backhoe tests) and at a minimum documented Munsell color, matrix texture, artifact content, the presence of features or in situ deposits and other relevant information. At least one wall of each test unit was drawn in profile with others documented as needed to establish geomorphological characteristics of the sediments.
- Though none were encountered, had testing resulted in the discovery of human skeletal remains, these would have been covered and left in situ until an acceptable data recovery program had been developed according to Missouri Public Law 194.400 et. seq.
- Subsurface investigations were terminated once sufficient data for a determination of significance or nonsignificance had been recovered. The impact of our investigations on the properties never exceeded that absolutely necessary to obtain this information.
- Deep (1 m - 1.5 m) posthole and auger tests were excavated at each property to detect the presence and nature of deposits below the plowzone.
- Excavation units varied in size and configuration and included 50 cm x 50 cm, 1 m x 1 m and 1 m x 2 m test units, 20 cm posthole tests, 30 cm shovel tests and 1 m wide backhoe trenches.
- Rodent holes, cultivated areas, tree tipups and eroded surface areas were reviewed for the presence of artifacts, middens and other evidence of past cultural activities. Actively eroding cutbanks represented a safety hazard and were not be reviewed according to paragraph b of contract Amendment No. P00001 dated 25 July 1990.
- Testing at deeply buried properties began with a determination of whether the overlying strata were culturally sterile and did not contribute to the significance of the property. Where culturally sterile or nonsignificant deposits were encountered in the 2+ m above the buried cultural strata, these were removed mechanically to allow controlled excavations to begin with the buried strata. Backhoe trench profiles were cleaned and documented as necessary.
- 23SR291 is located next to Rockhouse Cave (23SR21), the deposits from which have been actively looted for the past several decades (Missouri Archaeological Society 1961). Testing at 23SR291 was conducted in a manner to take all reasonable steps to reduce drawing any public attention to the site.

All controlled excavation units were excavated to 10 cm below the last cultural stratum with an additional 50 cm deep posthole test excavated at the base of the unit into culturally sterile soil (or to rock, hardpan or other impenetrable levels). This resulted in test units extending to at least 60 cm below the last artifacts.

General Considerations. With the exception of the talus slope at 23SR291, all the properties represent the results of activities conducted at open air localities by prehistoric peoples. The kinds of activities represented at the deeply buried properties (23CE339, 23CE440, 23CE442, 23CE444, 23SR1067 and 23CE446) were not established by previous investigators. What was known was that they clearly took place on landforms subject to significant aggradation with 2 m to 4 m of deposits overlying the documented strata.

Cultural deposits sometimes extended only a few centimeters below the surface. Other deposits were sometimes thin and buried under several meters of colluvium or alluvium. The testing program took into account these vastly different circumstances and ensured clear and consistent documentation. Controlled excavation to at least 60 cm below artifact bearing soils allowed better documentation of the deposits at each property.

Laboratory Considerations. Ceramics were sorted according to their morphological characteristics and identified according to established types for the Western Prairie Region (Chapman 1980). Tempering agents were identified as were surface treatments and other attributes. Lithic artifacts were sorted according to a model of lithic reduction that includes flakes of primary and secondary decortication, retouch and thinning flakes and various categories of waste flakes. All identifiable points were classified according to established types including Scallorn, Dalton, Beaver Lake, Smith, Table Rock and Gibson. Exotic or non-local raw materials were identified to assist in the assessment of site type (e.g., base settlements/specialized activity areas) as well as in the identification of age and possible activities that may have taken place at each property. We also hoped that this would result in a clearer understanding of past human use of and adaptation to the landscape of the Western Prairie Region of Missouri.

Focus of the Assessment Effort. With the exception of 23SR1067, which was occupied during the Late Archaic and/or Early Woodland periods, none of the other sites have been sufficiently investigated to establish their cultural affiliation or function. Even after all the work that has been conducted at the Stockton, Truman and Pomme de Terre reservoirs, principal investigators generally agree that the culture history and chronology of the region remain poorly understood. Western Prairie culture history is not well known although the preceramic Afton Complex and the ceramic period Blackwell Complex, Fristoe Burial Complex, Lindley Focus, Nemo Complex and Vista Focus have been identified in the area.

Roper (Wood et al. 1977) identified Dalton activities at 23CE261 in her Downstream Stockton study. She also found Middle Archaic occupations at 23CE227, 23CE235, 23CE237, 23CE242 and 23CE253; Archaic activities at 23CE227, 23CE234, 23CE242, 23CE243, 23CE248, 23CE250, 23CE253 and 23CE258; and Woodland Period components at 23CE224, 23CE226, 23CE227, 23CE229, 23CE236, 23CE241, 23CE242, 23CE243, 23CE244, 23CE245, 23CE249, 23CE251, 23CE253, 23CE255 and 23CE258.

Perttula and Purrington (1983) also documented Woodland Period activities at 23CE324, 23CE235, 23CE240, 23CE241 and 23CE252 in their Below Stockton Dam study for the District. While evidence of Paleo-Indian activities in the reservoir area has not yet been found it remains possible that truly early artifacts are present in the lowest levels of the 23CE439. Work at Stockton sites has been documented by various investigators including Calabrese et al. (1968 and 1969), Chapman (1965), Chapman et al. (1962 and 1963), Collins et al. (1983), Heldman (1960), Holland (1985), Kaplan et al. (1967), McMillan (1965 and 1968), Moffat and Houston (1986), Nichols et al. (1980), Pangborn (1965, 1966), Pangborn et al. (1971), Schmits (1988), Ward (1968), Wood (1965 and 1966) and Wood and Pangborn (1968a, 1968b and 1968c) (also see Anonymous n.d., 1960; Wood and McMillan 1976; Falk 1969; Lippincott 1972; McMillan 1966).

Assemblages from each of the sites were studied from the perspective of how they can help refine culture history and chronology. Datable contexts were of particular importance in furthering our understanding of the chronology of past use of the area. It should be remembered that much of what we know about chronology in the area comes from Rodgers Shelter to the north. Of particular interest in this regard was the position of the cultural deposits at many of the properties relative to the current surface. Although past use of the region is well documented we really do not know the particulars of how people exploited and adapted to their natural environment. We generally know where people have used the landscape in the past because this is largely a function of the availability of suitable habitats.

UMAAD and CAR investigators have worked toward developing settlement models that account for past use of the landscape at Stockton. Both Roper (Wood et al. 1977) and Perttula Purrington (1983) used catchment analysis to help identify factors that may have been important in prehistoric settlement behavior. Catchment size in both studies included the area in a one mile radius of each property. No data were available from the single Dalton component identified by Roper at 23CE261. Roper interpreted Archaic settlements to revolve around at least semi-permanent base camps located in the bottoms with evidence of Late Archaic activities found both along the bluff base as well as on the broad floodplains. Roper's Woodland Period components reflect small hamlets on the lower terraces a relatively short distance from the forested valley walls (Wood et al. 1977:94). At least some of the Downstream Stockton sites appear similar to the Woodland villages at Flycatcher and Dryocopus excavated along the Sac River by Calabrese et al. (1968 and 1969) and Kaplan et al. (1967).

Investigations by Perttula and Purrington (1983:118) focused on Woodland components in the area below the Stockton Dam. CAR followed Roper's lead and used catchment analysis to help interpret characteristics of Woodland settlement behavior. The CAR study identified various elements in the Woodland Period settlement system including permanent settlements like that at Flycatcher (Calabrese et al. 1968; Pangborn et al. 1971) with the possible association of horticulture, temporary camps in rockshelters, Bolivar and Stockton Complex cairns and upland and floodplain hunting and gathering camps or specialized activity sites.

We view site function in terms of how it relates to subsistence. With few exceptions, all activities carried out at either permanent or temporary sites are related to basic subsistence behavior. Site function must therefore first be assessed in connection with subsistence practices. Methods of procuring basic foodstuffs can be understood through a model involving gathering, fishing, hunting and agriculture (cf. Plog 1974).

Gathering-Fishing-Hunting (GFH) -- Although this combination of strategies may be used in any proportion to each other (to the exclusion of agriculture), the basic model assumes that gathering and fishing are more important than hunting in terms of an energy expended/captured ratio (cf. Lee 1966). This is not to say that gathering and fishing are the most efficient at any given time in an annual cycle. The reverse may well be true in some environments but not in others. The point here is that over a period of time, the GFH strategy of capturing energy is dominated by gathering activities that are supplemented by fishing and hunting. This subsistence system has been suggested to be the basic one employed by the inhabitants of the Western Prairie for most of their 10,000 year history.

Agriculture-Gathering-Fishing-Hunting (AGFH) -- A system using mainly agriculture to subsist will also routinely exploit floral, aquatic and faunal resources in varying proportions. In times when crop returns are unexpectedly low, natural foodstuffs can serve as buffer resources.

Site function and settlement patterns are closely related. Our model is founded on the assumption that people carry out particular activity sets at particular locations because it is most efficient to do so. From this, our model calls for 6 site types (read settlement patterns/site functions):

- *GFH* winter-spring base settlements
- *GFH* winter-spring specialized activity sites
- *GFH* summer-fall family base settlements
- *GFH* summer-fall specialized activity sites
- *AGFH* year-round base settlements
- *AGFH* specialized activity sites

While numerous research areas might be addressed during the investigations, we recognized that perhaps the most practical one for providing useful data relates to chert procurement. Our model of lithic procurement (in its simplest form) includes choosing a source of raw material and traveling to it, acquiring the desired material and transporting it to the point of intended use. Analysis of raw material use and availability was important in this regard.

RESULTS

Sufficient work was accomplished at each of the sites in this study to determine if cultural deposits potentially eligible for inclusion in the National Register of Historic Places existed *within the boundaries of Corps of Engineers Easements*. We have been able to determine if the Government has additional responsibilities for preservation or data recovery measures within the limits of the easements, as they existed when the sites were tested. Since many of the sites extended beyond the limits of Government easements, our conclusions apply to only those portions that we were able to investigate and should not be regarded as the final word for entire sites. Sites that we have determined to be ineligible for inclusion in the National Register will require reassessment if future river migration requires the relocation of Government easements.

In order to provide a foundation from which to read the following site specific discussions we have developed a series of tables that together form the background and summary data for the assessment efforts. Summary physical characteristics include natural setting, elevation, slope, parent material, vegetation and surface visibility and current land use (Table 4). All of sites tested are in alluvial settings on the floodplain or on adjacent natural levees with slopes never exceeding 2%. Most are currently being farmed or are in pasture.

Table 4. Physical characteristics of Downstream Stockton sites.

Site	Natural Setting	Elevation	Slope	Material	Vegetation/Visibility	Current Use
23CE46C	natural levee	755	<2%	alluvium	cultivated field/50%	farming
23CE439	natural levee	750-755	<1%	alluvium	cultivated field/100%	farming/woods
23CE440	na	na	na	alluvium	na	na
23CE442	natural levee	750	<1%	alluvium	grasses, trees/0%	pasture/woods
23CE444	natural levee	760	1%	alluvium	cultivated field/25%	farming
23CE446	natural levee	750	<1%	alluvium	cultivated field/50%	farming
23SR291	natural levee	720	1%	alluvium	weeds, grasses/0%	fallow field
23SR1067	natural levee	740-745	1%	alluvium	pasture/<10%	pasture

Background characteristics include data in connection with COE Real Estate Tract numbers and the dates during which the HPA assessment efforts took place (Table 5). Note that the Kansas City District was the recording agency in all instances and except for 23SR291, all the sites were recorded by ESA during their January 1988 field survey.

Table 5. Background characteristics of Downstream Stockton sites.

Site	Real Estate Tract	Recording Agency	Recorded by and Date	HPA Date
23CE46C	2508E2	Kansas City District	ESA 1-88	12-90/1-91
23CE439	2505E, 2506E, 2507E	Kansas City District	ESA 1-88	3/91/4-91
23CE440	2508E2, 2509E	Kansas City District	ESA 1-88	4-91
23CE442	2502E	Kansas City District	ESA 1-88	10-90/11-90/4-91
23CE444	2501E1	Kansas City District	ESA 1-88	2-91/3-91/4-91
23CE446	2512E	Kansas City District	ESA 1-88	10-90/11-90
23SR291	2702E1	Kansas City District	UMC 7-75	8-90
23SR1067	2603E	Kansas City District	ESA 1-88	9-90/10-90

Surface material was found at 4 of the sites with no surface evidence exhibited at the other 3 (Table 6). We posthole tested 5 of the sites with numbers ranging from 2 at 23CE46C to 53 at 23CE444. Although only 1 test unit was excavated at 23SR291 (2 m^2), 9 were excavated at 23CE444 (18 m^2). Total excavations at all sites covered 77 m^2 . Site sizes are estimated for the areas within the COE easements and are not intended to reflect total extent of the deposits. We found that river action has severely impacted each of the sites (excepting 23SR291) with bank loss ranging from <5 m at 23CE444 to as much as 30 m at 23CE46C and 23CE440.

Table 6. HPA investigations at Downstream Stockton sites.

Site	Surface Material	Posthole Tests	Test Units (# + m ²)	Backhoe Tests	Site Size within Easement	Bank Loss Since Tract KCD Maps
23CE46C	yes	2	3 = 6 m ²	no	6500 m ²	30 m/98+ ft
23CE439	yes	none	7 = 14 m ²	yes	36500 m ²	12 m/39+ ft
23CE440	na	none	none	no	na	30 m/98+ ft
23CE442	no	none	3 = 6 m ²	yes	unknown	20 m/65+ ft
23CE444	yes	53	9 = 18 m ²	yes	2000 m ²	<5 m/16+ ft
23CE446	yes	45	8 = 16 m ²	yes	4900 m ²	20 m/65+ ft
23SR291	no	10	1 = 2 m ²	no	2750 m ²	none apparent
23SR1067	no	25	8 = 15 m ²	yes	33000 m ²	10 m/32+ ft

A substantial number of cubic meters were hand and backhoe excavated at the Downstream Stockton sites (Table 7). Hand excavations ranged from 1.94 m³ at 23SR291 to 16.62 m³ at 23CE444. Total hand excavations for all sites amount to 63.54 m³. Deep backhoe trenches were excavated at 5 sites with volumes ranging from 39.35 m³ at 23SR1067 to 126 m³ at 23CE446. Total backhoe excavations for all sites amount to 384.60 m³. Combined excavations at the tested sites ranged from 1.94 m³ at 23SR291 to 135.67 m³ at 23CE446 with 448.14 m³ having been excavated at all sites.

Table 7. Cubic meters excavated at Downstream Stockton sites.

Site	Test Units/Posthole Tests	Hand Excavation	Backhoe Excavation	Total
23CE46C	Test Unit 1	1.93		1.93
	Test Unit 2	3.00		3.00
	Test Unit 3	1.13		1.13
	subtotal	6.06		6.06
23CE439	Test Unit 1	0.42		0.42
	Test Unit 2	1.63		1.63
	Test Unit 3	0.90		0.90
	Test Unit 4	1.83		1.83
	Test Unit 4 & Backhoe Trench 1	0.50	34.00	34.50
	Test Unit 5	1.83		1.83
	Test Unit 6	1.83		1.83
	Test Unit 7 & Backhoe Trench 2	1.23	26.25	27.48
	subtotal	10.17	60.25	70.42
23CE442	Test Unit 1 & Backhoe Trench 1	2.00	18.00	20.00
	Test Unit 2 & Backhoe Trench 2	1.87	18.00	19.87
	Test Unit 3 & Backhoe Trench 3	1.43	24.00	25.43
	subtotal	5.30	60.00	65.30
23CE444	Test Unit 1	0.71		0.71
	Test Unit 2	2.55		2.55
	Test Unit 3	0.92		0.92
	Test Unit 4	1.32		1.32
	Test Unit 5	1.80		1.80
	Test Unit 6	0.72		0.72
	Test Unit 7 & Backhoe Trench 1	1.32	15.00	16.32
	Test Unit 8 & Backhoe Trench 2	1.81	84.00	85.81
	Test Unit 9	3.89		3.89
	Posthole Tests	0.79		0.79
	subtotal	16.64	99.00	115.64
23CE446	Test Unit 1	0.83		0.83
	Test Unit 2 & Backhoe Trench 1	1.24	63.00	64.24
	Test Unit 3 & Backhoe Trench 2	1.84	63.00	64.84
	Test Unit 4	0.83		0.83
	Test Unit 5	1.44		1.44
	Test Unit 6	1.14		1.14
	Test Unit 7	1.03		1.03
	Test Unit 8	0.63		0.63
	Posthole Tests	0.69		0.69
	subtotal	9.67	126.00	135.67
23SR291	Test Unit 1	1.49		1.49
	Posthole Tests	0.45		0.45
	subtotal	1.94		1.94
23SR1067	Test Unit 1	2.29		2.29
	Test Unit 2	3.07		3.07
	Test Unit 3 & Backhoe Trench 1	1.30	1.87	3.17
	Test Unit 4 & Backhoe Trench 2	1.35	1.87	3.22
	Test Unit 5 & Backhoe Trench 3	2.65	1.87	4.52
	Test Unit 6 & Backhoe Trench 4	0.87	1.87	2.74
	Test Unit 7 & Backhoe Trench 5	0.77	1.87	2.64
	Test Unit 8	0.90		0.90
	Posthole Tests	0.56		0.56
	Backhoe Trenches		18.00	18.00
	subtotal	13.76	18.00	53.11
Total		63.54	384.60	448.14

23CE46C

23CE46C is located on the north side of an outer bend of the Sac River. It occupies about 6,500 m² of Real Estate Tract 2508E2 and extends northward an unknown distance, nearly reaching the county road located about 370 m to the north. Surface materials are located on a slight rise that appears to be a natural levee formed by a previous river channel within the limits of the COE easement. Nearly all the site was under cultivation but that portion of it located on the west slope of the rise was covered with mixed hardwoods. The riverbank is actively eroding and there are no trees bordering the river that would slow the erosion. At the time of our investigations, the site was fallow and a portion of it had been recently chisel plowed to a depth of 30 cm to 40 cm. Those areas that were not freshly plowed were covered with soybean thatch.

Our work began on 3 December 1990 and was completed on 17 January 1991. The weather during this time was a serious impediment due to abundant precipitation and extreme cold, which required a stoppage in work between 5 and 13 January and after the site was completed between 17 January and 19 February. Boundaries of the easement were first resurveyed to confirm that we were in the correct location and to establish the limits of our work area (Figure 4). By using the original survey notes and topographic maps provided by the Kansas City District we relocated COE survey markers 62, 62A and 62B. The latter two were clearly marked on the ground and were easily relocated. The first was buried at a depth of 2 ft (about 61 cm) in the field and was located (but not uncovered) with transit and tape. A site datum was established on the north easement boundary 50 m east of 62A. Subsequent investigations included a controlled surface collection and the excavation of 3 1 m x 2 m test units and 2 posthole tests. As a result, almost 5,400 items (Table 8), both cultural and non-cultural were recovered as well as information on the nature and extent of the cultural deposits. Cultural materials recovered during our work at 23CE46C are presented in detail in Appendix C.

Table 8. Artifacts recovered from 23CE46C.

Artifact Description	Ct	Wt (g)				
Arrow point midsection	1	1.7	Flake, primary decort	16	73.0	
Biface fragment	8	46.6	Flake, retouch	572	184.1	
Brick, red frag (discard)	2	18.5	Flake, secondary decort	42	194.1	
Burned clay	780	1924.6	Floral, unidentified		6.4	
Burned soil	67	2.5	Glass, clear bottle	3	9.8	
Charcoal, unidentified	206	1.9	Ground stone, misc.	3	375.3	
Chippable stone, unmod	30	12886.6	Hammer head	1	508.4	
Coal	181	63.6	Limestone	22	70.2	
Cobble, tested	7	1027.0	Mussel shell	3	1.4	
Core	9	1232.6	Nut and bolt	1	28.3	
Dart point midsection	1	4.1	Preform/fragments	9	301.3	
Dart point stem/base	8	27.9	Quartz	2	980.5	
Fire-cracked rock	824	6781.0	Sandstone	1470	23397.4	
Flake knife	1	22.3	Shatter	449	4342.4	
Flake, broken	200	255.2	Shotgun shell base 12ga.	1	1.3	
Flake, interior	471	853.8	Stone, unidentified	3	3.1	
Flake, modified	1	49.5	Total	5394	57655.3	

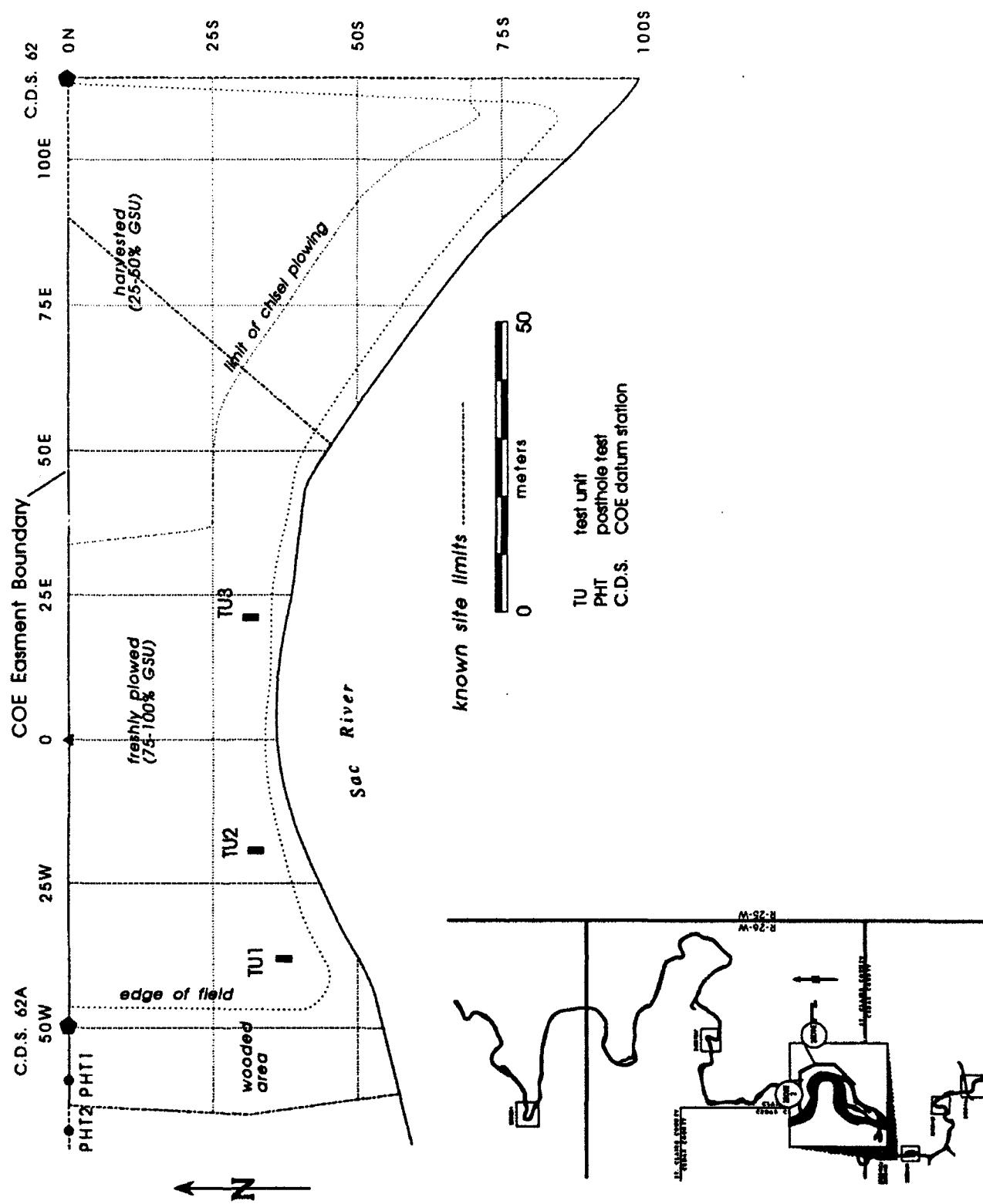


Figure 4. 23CE46C showing the location of the HPA work.

A grid of 334 5 m x 5 m collection squares (Figure 5) was established by laying out 4 north-south lines of 5 meter interval stakes (at 45 m west, 0 m west, 50 m east and 100 m east) and taping in east-west lines of 5 m interval pin flags between them. Where no stakes could be established with the transit, collection squares were laid out by triangulating from established points on the grid. All cultural materials were collected from the entire easement east of the 45 west line. Each collection unit was walked at 1 m intervals both north-south and east-west (a total of 12 trips across each unit) to ensure complete systematic coverage and to avoid wasting time wandering aimlessly about the units. A field form was maintained that documented the project name, site number, date, collection unit size, provenience of each unit (by the northwest corner), an estimate of ground surface visibility, the initials of the collector and a rough count of the materials recovered. The cultural materials were placed in paper nail bags labeled with the site number, unit provenience, collector's initials and the date.

Of 334 collection units, 210 yielded cultural materials, including 1 arrow point midsection, 1 biface, 8 biface fragments, 2 pieces of burned clay, 22 unmodified chert cobbles (21 of which were of workable quality), 35 pieces of coal, 7 tested cobbles, 9 cores, 12 dart point fragments, 60 pieces of fire-cracked chert, 237 pieces of fire-cracked sandstone, 137 broken flakes, 281 interior flakes, 12 primary decortication flakes, 275 retouch flakes, 22 secondary decortication flakes, 2 fragments of ground stone tools, 2 pieces of mussel shell, 1 preform, 5 preform fragments, 1 piece of quartz, 1,132 pieces of unmodified sandstone, 373 pieces of shatter and 7 historic period artifacts. Collection units that yielded at least 1 item are shown in Figure 5 as solid squares while those that yielded no artifacts are shown (where possible) as dotted squares. The average artifact yield per unit was 7.9 with a standard deviation of 11.22. Figure 6 shows a line graph of the distribution of artifact counts and the number of units yielding each. The most notable characteristic of these data is that they are badly skewed to the left and, therefore, not amenable to standard parametric procedures. An association matrix was generated for the number of times each artifact type occurred in association with the others in an attempt to determine whether surface deposits have retained any integrity (Table 9). If we look in the column for primary decortication flakes (0004) and the row for secondary decortication flakes (0005), the upper left number represents the number of collection units that yielded neither primary nor secondary decortication flakes while the lower right number represents the number of collection units that yielded both. The upper right number represents the number of units that yielded primary decortication flakes but not secondary and the lower left number represents the number of units that yielded secondary decortication flakes but not primary. A Jaccard Coefficient of Association (computed by dividing the number of joint occurrences by the total number of occurrences and excluding the units in which neither occurred) shows the strength of association between any 2 categories of artifacts (Table 10). In this example, the coefficient is 0 since primary and secondary decortication flakes are distributed in a mutually exclusive manner. A table of Jaccard Coefficients shows that the only notable associations occur between sandstone (0402) and 3 categories of lithic debris (0006, 0007, 0009). Even here, the associations are not strong and probably result from the large number of these materials. The high association between quartz (0609) and the arrow point midsection (0106) is not meaningful since only one of each was recovered. That they were recovered from the same collection unit is probably fortuitous. We believe that the surface materials at 23CE46C hold little data potential because they have been obviously displaced by plowing and erosion and many cultural diagnostics and other tools have been removed by collectors.

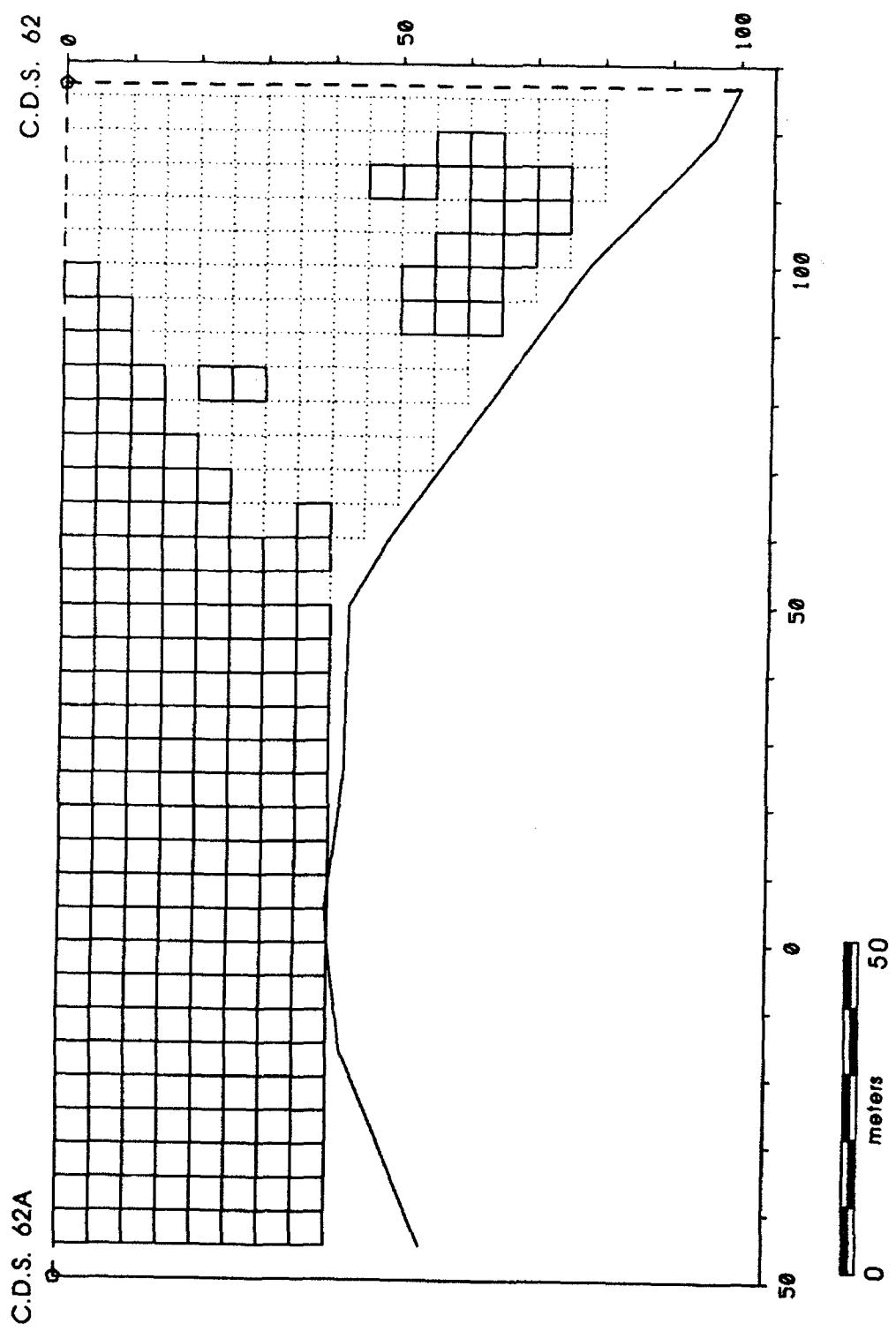


Figure 5. 23CE46C showing the HPA surface collection grid.

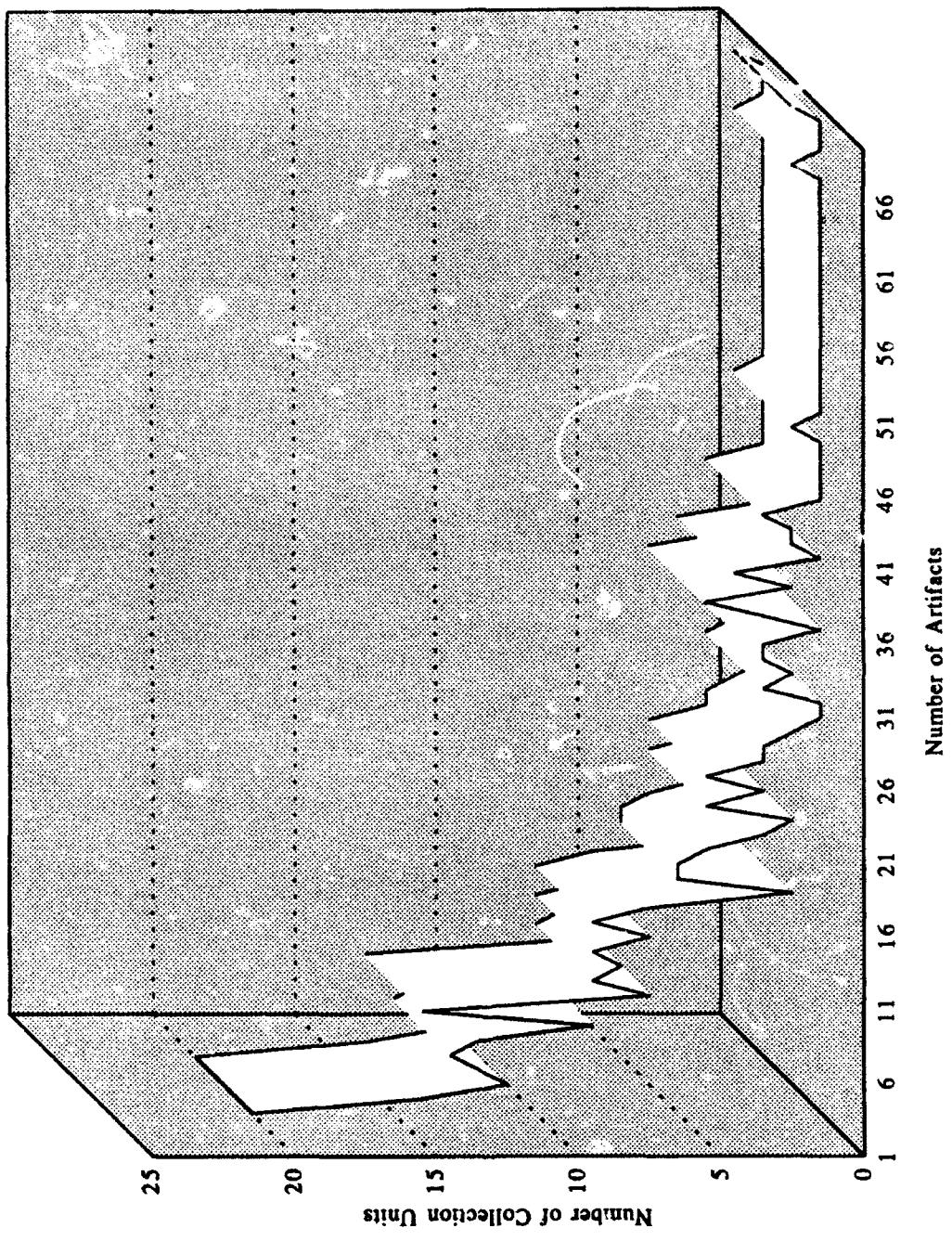


Figure 6. Artifacts in controlled surface collections at 23CE46C.

With the exception of a single biface fragment found in the first 10 cm of Test Unit 2, all other tools and tool fragments recovered from 23CE46C were found in surface contexts. The stem and base of a Table Rock variant biface (Cat. No. 8-1) was found in Surface Unit 8 (0N/10W). This tool is manufactured from Jefferson City/Cotter undifferentiated chert Variety 1, weighs 2.5 g and measures 2.02 cm x 2 cm x .52 cm (all measurements, full and fragmentary, are expressed as maximum length x maximum width x maximum thickness). There is no indication of possible use of this tool. Table Rock points date to the Terminal Archaic Period (3000 BC - 1000 BC). An expanding stem hafted biface frag. . (Cat. No. 25-3) was found in Surface Unit 25 (0N/75E). This tool has angular tangs and a convex base, is manufactured from heat-treated Burlington chert Variety 2, weighs 2.7 g and measures 1.36 cm x 2.9 cm x .63 cm. There is no indication of possible use of this tool. This artifact probably dates to the Archaic Period. A preform fragment (Cat. No. 43-5) was found in Surface Unit 43 (5S/25E). This artifact is manufactured from heat-treated Jefferson City/Cotter undifferentiated chert Variety 1, weighs 12.5 g and measures 3 cm x 2.86 cm x 1.1 cm. It is likely that this tool was used in scraping activities and cannot be dated. The mid-section of a biface (Cat. No. 45-3) was found in Surface Unit 45 (5S/35E). This tool is manufactured from heat-treated Jefferson City/Cotter undifferentiated chert Variety 1, weighs 4.0 g and measures 3.4 cm x 2.04 cm x .7 cm. Heavy edge-rounding and use-polish are evident along with indications of bone contact from cutting activities. This artifact cannot be dated.

A thin advanced stage preform fragment (Cat. No. 46-3) was found in Surface Unit 46 (5S/40E). This artifact is manufactured from heat-treated Jefferson City/Cotter undifferentiated chert Variety 1, weighs 2.3 g and measures 2.23 cm x 1.68 cm x .52 cm. There is no indication of use and this artifact cannot be dated. The tip of a biface (Cat. No. 69-4) was found in Surface Unit 69 (10S/15E). This tool is manufactured from a slightly heat-treated Jefferson City/Cotter undifferentiated chert Variety 1, weighs 2.3 g and measures 2.52 cm x 1.65 cm x .6 cm. Light edge-rounding and use-polish indicate that this tool had been used in cutting activities. This artifact cannot be dated. A hafted biface stem fragment (Cat. No. 70-8) was found in Surface Unit 70 (10S/20E). This artifact has slightly rounded tangs and a convex base, is manufactured from Burlington chert Variety 2, weighs 2.3 g and measures 1.2 cm x 3.04 cm x .61 cm. Although there is no evidence of use on this tool it is likely that it dates to the Archaic Period. A Scallorn-like arrow point (Cat. No. 70-9) was also found in Surface Unit 70 (10S/20E). This serrated tool is made from heat-treated Burlington chert Variety 3, weighs 1.7 g and measures 1.82 cm x 1.22 cm x .3 cm. Scallorn points date to the Late Woodland Period (AD 500 - AD 900). An aborted preform (Cat. No. 72-5) was found in Surface Unit 72 (10S/30E). This tool is manufactured from Jefferson City/Cotter undifferentiated chert Variety 1, weighs 28.1 g and measures 6.51 cm x 3.3 cm x 1.58 cm. It is likely that the preform was aborted because of an edge that could not be thinned. Slight use-polish indicates cutting activities. This tool cannot be dated.

A hafted biface (Cat. No. 75-4) was found in Surface Unit 75 (10S/45E). This tool is manufactured from Burlington chert Variety 2, weighs 4.9 g and measures 1.9 cm x 3.35 cm x .5 cm. Some slight edge-rounding and use-polish suggest cutting during skinning and butchering activities. It is likely that this tool dates to the Archaic Period. The tip of a biface (Cat. No. 87-3) was found in Surface Unit 87 (15S/25W). This tool is manufactured from Burlington chert, weighs

Table 9. Co-occurrence of artifacts at 23CE46C.

Table 10. Jaccard coefficients of similarity for artifacts at 23CE46C.

Code	0001	0002	0003	0004	0005	0006	0007	0008	0009	0102	0103	0106	0109	0124	0125	0201	0400	0401	0402	0605	0609	08XX	1000	
0001	1.000																							
0002	0.038	1.000																						
0003	0.120	0.071	1.000																					
0004	0.033	0.000	0.000	1.000																				
0005	0.108	0.077	0.036	0.000	1.000																			
0006	0.083	0.026	0.035	0.061	0.139	1.000																		
0007	0.084	0.010	0.030	0.070	0.104	0.346	1.000																	
0008	0.041	0.016	0.032	0.030	0.114	0.295	0.244	1.000																
0009	0.076	0.029	0.036	0.074	0.099	0.476	0.435	0.297	1.000															
0102	0.050	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.000	1.000														
0103	0.077	0.000	0.000	0.056	0.074	0.073	0.040	0.083	0.044	0.000	1.000													
0106	0.050	0.000	0.000	0.000	0.000	0.009	0.010	0.018	0.007	0.000	0.125	1.000												
0109	0.000	0.000	0.000	0.000	0.000	0.043	0.040	0.032	0.044	0.000	0.000	0.000	1.000											
0124	0.000	0.000	0.000	0.000	0.000	0.009	0.010	0.035	0.015	0.000	0.000	0.000	0.000	1.000										
0125	0.038	0.000	0.000	0.000	0.077	0.026	0.052	0.032	0.052	0.000	0.000	0.000	0.000	0.000	0.000	1.000								
0201	0.000	0.000	0.125	0.000	0.000	0.009	0.010	0.018	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000							
0400	0.115	0.058	0.077	0.073	0.113	0.215	0.116	0.105	0.188	0.021	0.037	0.000	0.000	0.000	0.019	0.000	1.000							
0401	0.064	0.028	0.086	0.051	0.109	0.129	0.145	0.130	0.130	0.033	0.086	0.000	0.057	0.000	0.000	0.000	0.200	1.000						
0402	0.092	0.033	0.044	0.061	0.104	0.532	0.473	0.286	0.637	0.006	0.038	0.006	0.039	0.011	0.039	0.006	0.199	0.153	1.000					
0605	0.029	0.095	0.000	0.000	0.028	0.096	0.077	0.058	0.110	0.000	0.000	0.000	0.095	0.000	0.045	0.000	0.164	0.150	0.088	1.000				
0609	0.050	0.000	0.000	0.000	0.000	0.009	0.010	0.018	0.007	0.000	0.125	1.000	0.000	0.000	0.000	0.000	0.006	0.000	0.000	1.000				
08XX	0.000	0.000	0.000	0.000	0.000	0.018	0.010	0.017	0.007	0.000	0.000	0.000	0.125	0.000	0.000	0.000	0.020	0.032	0.011	0.059	0.000	1.000		
1000	0.000	0.000	0.000	0.083	0.000	0.018	0.000	0.000	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.000	0.011	0.000	0.000	0.000	1.000	

0001 = Unmodified chippable stone; 0002 = Tanged cobble; 0003 = Core; 0004 = Primary decortication flake; 0005 = Secondary decortication flake; 006 = Interior flake
 0007 = Retouch flake; 0008 = Broken flake; 0009 = Shatter; 0102 = Dart point midsection; 0103 = Dart point stem/base; 0106 = Arrow point midsection; 109 = Biface fragment; 0124 = Preform; 0125 = Preform fragment; 0201 = Flake knife; 0400 = Fire-cracked sandstone; 0401 = Fire-cracked chert; 0402 = Sandstone; 0605 = Coal; 0609 = Quartz; 08XX = Faunal remains; 1000 = Burned clay

8.1 g and measures 4.98 cm x 2.7 cm x .53 cm. The tip edges show some slight edge-rounding and use-polish suggested skinning activities. This artifact cannot be dated. A preform broken during manufacture (Cat. No. 95-1) was found in Surface Unit 95 (15S/15W). This tool is made from heat-treated Pierson chert, weighs 94.2 g and measures 7.65 cm x 5.65 cm x 1.88 cm. The preform was beveled on the edge for reduction, shows some evidence of cutting activities and cannot be dated. A small hafted biface (Cat. No. 100-6) with a slightly expanded stem was found in Surface Unit 100 (15S/40E). This biface is manufactured from heat-treated Reeds Spring chert, weighs 4.7 g, measures 3.0 cm x 2.51 cm x .69 cm and evidences significant edge-rounding and some use-polish from cutting activities. It is likely that this tool dates to the Late Woodland Period (AD 500 - AD 900). A preform (Cat. No. 102-1) beveled for reduction was found in Surface Unit 102 (15S/50E). This tool is manufactured from heat-treated Pierson highly tripolized chert Variety 1, weighs 33.3 g and measures 5.8 cm x 4.4 cm x .9 cm. The preform shows no evidence of use and cannot be dated.

A broken preform (Cat. No. 109-4) was found in Surface Unit 109 (20S/35W). This tool is manufactured from heat-treated Jefferson City/Cotter/Oolitic chert, weighs 42.7 g and measures 5.55 cm x 5.7 cm x 1.9 cm. The artifact shows some use as a cutting implement along one edge and cannot be dated. The distal portion of a biface (Cat. No. 116-3) was found in Surface Unit 116 (20S/0E). This tool is manufactured from heat-treated Burlington chert Variety 1, weighs 7.2 g and measures 3.05 cm x 3.15 cm x 5.8 cm. Some use-polish and edge-rounding suggest cutting activities. This artifact cannot be dated. A fragment from the edge of a biface (Cat. No. 123-4) was found in Surface Unit 123 (20S/35E). This tool is manufactured from Burlington chert Variety 1, weighs 3.9 g and measures 3.35 cm x 1.8 cm x .62 cm. It appears that this tool had been broken during reduction, shows little use-polish and cannot be dated.

A large preform fragment (Cat. No. 132-1) was found in Surface Unit 132 (25S/40W). This tool was broken during its manufacture from heat-treated Burlington chert Variety 1, weighs

48.1 g and measures 6.1 cm x 6.39 cm x 1.4 cm. There is no evidence that this tool had been used and it cannot be dated. A biface fragment (Cat. No. 142-1) most likely broken during reduction was found in Surface Unit 142 (25S/10E). This artifact was manufactured from a slightly heat-treated Burlington chert Variety 1, weighs 15.5 g and measures 4.4 cm x 3.35 cm x 1.09 cm. There is no evidence that this tool had been used and it cannot be dated. The base of an unhafted biface (Cat. No. 144-4) was found in Surface Unit 142 (25S/20E). This tool was manufactured from heat-treated Burlington chert Variety 2, weighs 5.3 g and measures 1.8 cm x 3.9 cm x .7 cm. Slight polish suggests that this tool may have been used in connection with cutting activities. This artifact cannot be dated. A large utilized reduction flake (Cat. No. 145-6) was found in Surface Unit 145 (25S/25E). This flake was struck from a larger piece of heat-treated Jefferson City/Cotter undifferentiated chert Variety 1, weighs 22.3 g and measures 4.4 cm x 5.32 cm x 1.15 cm. Although this flake cannot be dated, the edge-rounding and use-polish suggest its use in cutting activities.

An expanding-stemmed dart point (Cat. No. 147-6) with a straight base and lightly ground edges was found in Surface Unit 147 (25S/35E). This point is manufactured from heat-treated Reeds Spring chert, weighs 3.9 g and measures 2.88 cm x 1.99 cm x .57 cm. The point was broken by an impact fracture and probably dates to the Archaic Period. A preform fragment (Cat. No. 148-5) was found in Surface Unit 148 (25S/40E). Edges of the preform had been beveled for reduction and it was probably broken during manufacture. This artifact is made from a highly weathered Burlington chert Variety 2, weighs 36.2 g and measures 3.62 cm x 5.01 cm x 1.78 cm. There is no indication that this tool was used and it cannot be dated. The tip of a biface (Cat. No. 149-4) was found in Surface Unit 149 (25S/45E). This tool is manufactured from Reeds Spring chert, weighs 3.1 g and measures 2.3 cm x 2.3 cm x .68 cm. Very light use-polish suggests use as a cutting implement. This artifact cannot be dated.

The mid-section of a hafted biface (Cat. No. 151-3) was found in Surface Unit 151 (25S/55E). This tool is manufactured from heat-treated Burlington chert Variety 2, weighs 4.1 g and measures 2.2 cm x 2.3 cm x .6 cm. Some use-polish and edge-rounding suggest use in cutting activities. This artifact cannot be dated. A Table Rock Pointed Stem point (Cat. No. 174-1) was found in Surface Unit 174 (35S/45W). This tool is manufactured from Lafayette chert, weighs 4.8 g and measures 2.7 cm x 3.02 cm x .6 cm. Slight use-polish suggests cutting activities. These points are associated with Early Mississippi Period activities (AD 900 - AD 1200).

Two posthole tests were excavated west of the treeline at 0S/60W and 0S/70W to determine how far past the west edge of the field the site extended. These were excavated to depths of 50 cm in 10 cm levels and the soil screened through ¼ inch mesh hardware cloth. Posthole Test 1 (0S/60W) yielded 1 piece of unmodified sandstone in level 2 (10 cm - 20 cm) and 1 retouch flake, 2 broken flakes and 3 pieces of fire-cracked sandstone in level 3 (20 cm - 30 cm). Posthole Test 2 produced no artifacts.

Three 1 m x 2 m test units were established at grid coordinates 35S/35W, 30S/16W and 30S/20E. These were excavated in 10 cm levels by troweling and shovel skimming, although excavation through a buried hardpan required the use of pick-mattocks. Excavated soil was screened through ¼ inch mesh hardware cloth and the cultural materials recovered placed in paper nail bags labeled with the site number, test unit number, level number, date and the initials of the

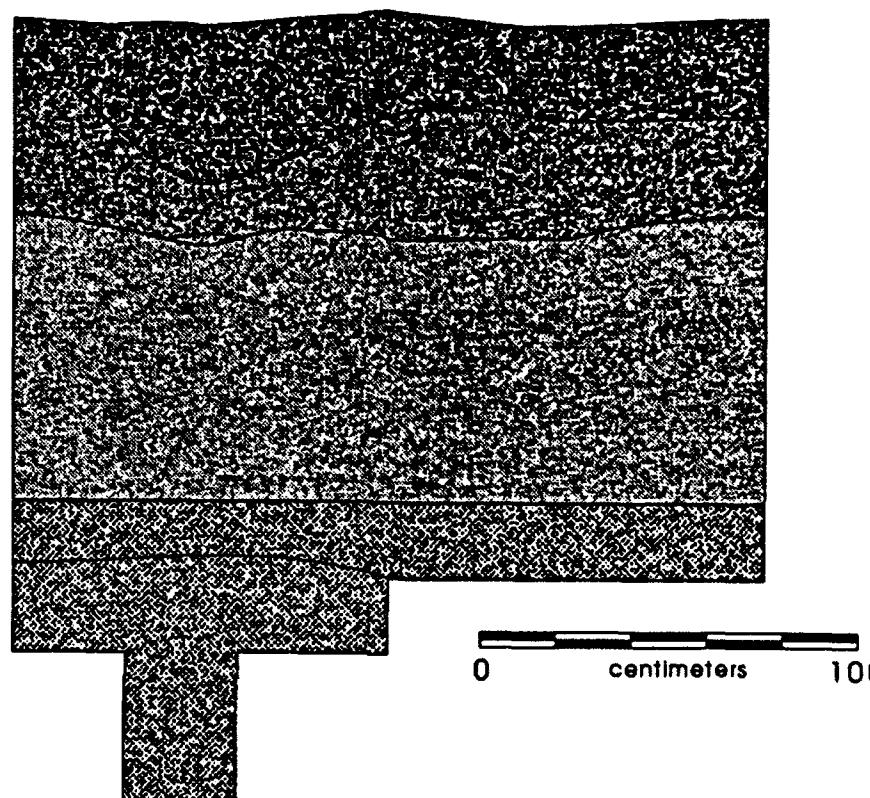
excavator and screener. Level forms were maintained that documented the project name, date, site number, excavator, screener, the unit designation, the unit size, the level size, the level number and depth in centimeters, excavation methods, how the soil was screened, soil characteristics, the integrity of the deposit, the presence and nature of cultural features, a count of general categories of artifacts, whether special samples were collected and other information deemed pertinent by the excavator. Excavation proceeded until a culturally sterile level was encountered, at which point a posthole test or 50 cm x 50 cm shovel test was excavated an additional 50 cm in 10 cm levels to confirm that the base of the deposits had been reached. Upon completion, one wall was drawn in profile and photographed in black and white and color slides.

Test Unit 1 was placed at 35S/35W in an area of high surface artifact density and excavated in 10 cm levels to a depth of 170 cm where a posthole test was excavated an additional 50 cm to 220 cm. A small basin-shaped pit feature was encountered at 45 cm. It was cleaned, photographed, cross sectioned and drawn in planview and profile. The fill was removed and bagged and a pollen sample collected. The unit was stepped down to 1 m x 1 m (north half) in level 10 (90 cm - 100 cm) due to the sharply diminished numbers of artifacts and the compactness of the soil that made excavating and screening difficult. Level 10 was culturally sterile but the third level of a posthole test yielded a flake and the unit was continued in the north half only until level 14 (130 cm - 140 cm) where additional cultural deposits were encountered. At that point, the south half of the unit was removed but only a 50 cm x 50 cm block from the southeast corner of each level was screened since levels 10 - 13 had been culturally sterile in the north half. The unit was, again, stepped down to 1 m x 1 m (north half) in levels 16 and 17 due to extreme difficulty encountered in screening the soil and the low return of cultural materials. Level 17 (160 cm - 170 cm) was culturally sterile, as was a 50 cm deep posthole test excavated in 10 cm levels to 220 cm.

Four strata were revealed in Test Unit 1 (Figure 8). Stratum 1 was a very dark grayish brown (10YR3/2) to dark brown (10YR3/3) silt loam that normally extended to 28 cm but reached 46 cm in one place. This dip in Stratum 1 gives the appearance of a feature in the profile drawing but was, in reality, much more amorphous, particularly in planview where it was difficult to distinguish. Stratum 2 was a brown (10YR4/3) silt loam that changed to brown (10YR5/3) with gray (10YR5/1) to light gray (10YR7/1) mottling in level 5, reaching depths of 54 cm to 62 cm. Stratum 3 was a brown to dark brown (7.5YR4/4) silt loam with light gray (10YR7/1) mottling that reached a depth of 83 cm to 90 cm and marked the base of the upper cultural zone. Stratum 4 was a brown to dark brown (10YR4/3) silty clay that reached the base of the excavation, changing to a dark brown (10YR3/3) color in level 14 and then dark yellowish brown (10YR3/4) with brown to dark brown mottling (10YR4/3) below 140 cm. A buried cultural zone was detected between 130 cm and 160 cm.

Cultural materials were abundant in the first 5 levels averaging 182 items per level. Level 1 (0 cm - 10 cm) yielded 1 primary decortication flake, 48 interior flakes, 55 retouch flakes, 13 pieces of chert shatter, 103 pieces of fire-cracked sandstone, 2 pieces of fire-cracked chert and 16 pieces of unmodified sandstone. Level 2 (10 cm - 20 cm) yielded 1 unmodified chert cobble, 19 interior flakes, 24 retouch flakes, 23 broken flakes, 10 pieces of shatter, 34 pieces of fire-cracked sandstone, 61 pieces of unmodified sandstone and 1 sherd of clear bottle glass. Level 3 (20 cm -

TEST UNIT 1 EAST WALL PROFILE



- [Pattern 1] 10YR3/3 to 10YR3/2 silt loam
- [Pattern 2] 10YR4/3 silt loam with 10YR5/1 and 10YR7/1 mottling
- [Pattern 3] 7.5YR4/4 silt loam with 10YR7/1 mottling
- [Pattern 4] 10YR4/3 silty clay
- [Pattern 5] 10YR3/4 silty clay with 10YR4/3 mottling

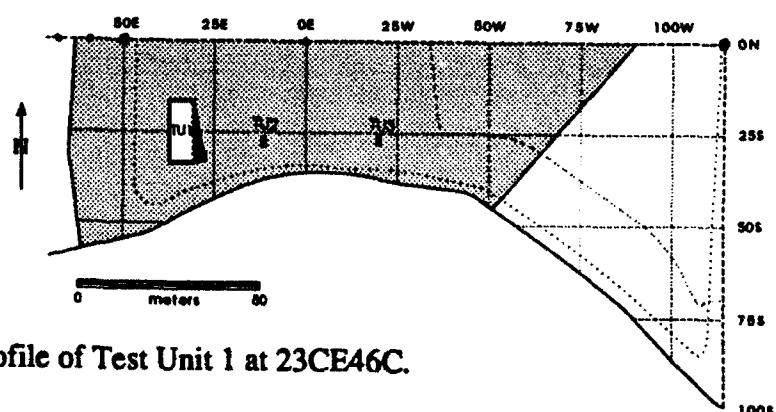


Figure 7. Profile of Test Unit 1 at 23CE46C.

30 cm) yielded 4 secondary decortication flakes, 17 interior flakes, 53 retouch flakes, 19 broken flakes, 6 pieces of chert shatter, 50 pieces of fire-cracked sandstone, 2 pieces of fire-cracked chert and 43 pieces of unmodified sandstone. Level 4 (30 cm - 40 cm) yielded 1 primary decortication flake, 2 secondary decortication flakes, 34 interior flakes, 50 retouch flakes, 14 pieces of chert shatter, 56 pieces of fire-cracked sandstone, 9 pieces of unmodified sandstone, 3 pieces of unidentified stone and 5 pieces of burned clay. Level 5 (40 cm - 50 cm) yielded 4 interior flakes, 8 retouch flakes, 5 pieces of chert shatter, 36 pieces of fire-cracked sandstone, 2 pieces of fire-cracked chert, 22 pieces of unmodified limestone, 51 pieces of unmodified sandstone, 1 piece of quartz and 1 piece of burned clay. In addition, a small feature (Figure 8) was discovered. This feature first appeared in Level 4 as an amorphous zone of staining containing charcoal and burned clay but was badly intermixed with the surrounding matrix and did not appear to be a feature. By 45 cm, it had become better defined and was designated as a feature at that point. It was irregular in planview and basin-shaped in profile with maximum horizontal dimensions of 35 cm (E-W) x 28 cm (N-S). Its maximum depth was 17 cm, reaching 62 cm below the test unit datum. The feature matrix was a very dark grayish brown (10YR3/2) silt loam that contained observable charcoal and burned clay. Flotation and finescreen processing yielded 27 pieces of fire-cracked sandstone, 2 interior flakes, 30 retouch flakes, 3 broken flakes, 771 pieces of burned clay, 205 pieces of unidentified charcoal, 67 pieces of burned soil and 6.4 grams of unidentified floral material. Its function is not known but it did not exhibit evidence of burning or fire-hardening, as would a hearth, and it appears too small to have served as a storage pit. The available evidence, although far from conclusive, suggests use as a small trash pit. Artifact content in Test Unit 1 declined dramatically below 50 cm. Level 6 (50 cm - 60 cm) yielded 2 interior flakes, 3 retouch flakes, 3 pieces of chert shatter, 10 pieces of fire-cracked sandstone, 2 pieces of fire-cracked chert, 6 pieces of unmodified sandstone and one fragment of unmodified chert. Level 7 (60 cm - 70 cm) yielded 1 decortication flake, 2 retouch flakes, 3 broken flakes and 4 pieces of unmodified sandstone. Level 8 (70 cm - 80 cm) yielded 2 retouch flakes and 5 pieces of unmodified sandstone. Level 9 (80 cm - 90 cm) yielded a modified flake and a piece of unmodified sandstone. Levels 10 through 13 (90 cm - 130 cm) were culturally sterile. Level 14 (130 cm - 140 cm) yielded 1 secondary decortication flake, 2 retouch flakes, 1 piece of fire-cracked chert and 1,758.1 grams of burned clay. Level 15 (140 cm - 150 cm) yielded 2 broken flakes and 122.6 grams of burned clay. Level 16 (150 cm - 160 cm) yielded 8.5 grams of burned clay. The remainder of the unit was culturally sterile.

Test Unit 2 was placed at 30S/16W on the crest of the ridge in an area of relatively high surface artifact density and excavated in 10 cm levels to a depth of 150 cm. The unit was stepped down to 1 m x 1 m (north half) in level 8 (70 cm - 80 cm) due to the sharply diminished numbers of artifacts and the compactness of the soil that made excavating and screening difficult. Level 8 was culturally sterile, as was a posthole test excavated in 10 cm levels to 130 cm. At that point, the unit was further excavated to a depth of 150 cm to investigate the possibility of a buried component in that part of the site. Only a 50 cm x 50 cm block from the northwest corner of each level was screened, with the remainder of each level removed and discarded. No evidence of features or a buried cultural deposit was recovered during the excavation of this unit.

FEATURE 1 PLAN VIEW AND PROFILE AT 45cm

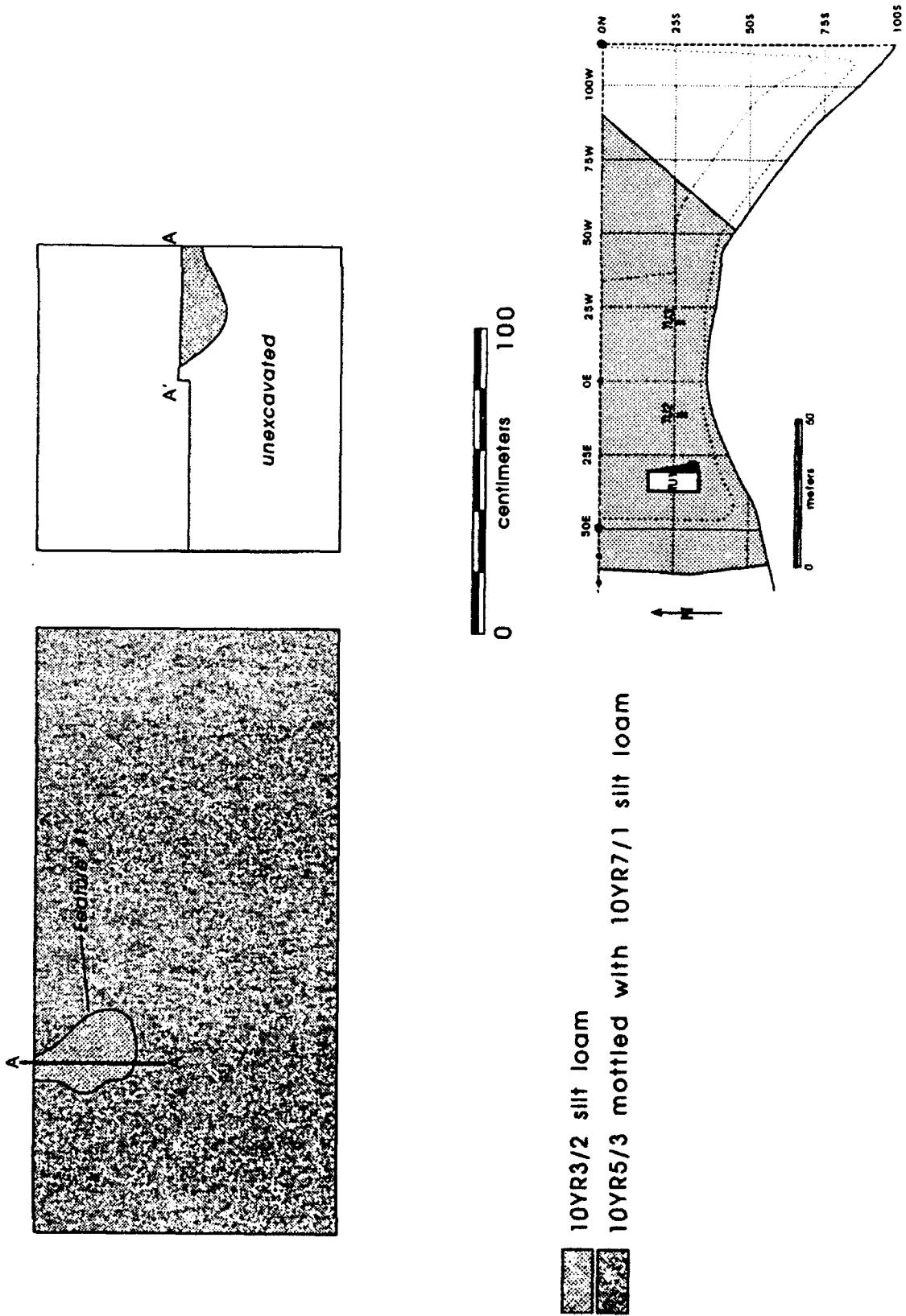


Figure 8. Profile and planview of Feature 1 at 23CE46C.

Three strata were revealed in Test Unit 2 (Figure 9). Stratum 1 was a dark brown (10YR3/3) silt loam that normally extended to 22 cm. The boundary between it and the underlying stratum was sharp and distinct, giving the appearance of a deeper plowzone. Stratum 2 was a dark yellowish brown (10YR4/4) silt loam that changed to brown to dark brown (7.5YR4/4) by the base of level 7. This stratum reached a normal depth of 80 cm to 84 cm but extended to 100 cm in one place. Cultural materials ceased to be present at about the point where the color change occurred. A buried hard pan was encountered in this stratum at about 50 cm and made excavating and screening the soil very difficult. Stratum 3 was a brown to dark brown (7.5YR4/4) silt loam that reached the base of the test unit at 150 cm. Munsell colors in the upper 40 cm of the stratum varied from brown to dark brown (7.5YR4/4) to strong brown (7.5YR4/6) to dark brown (7.5YR3/4). The soil exhibited a more blocky structure than in Stratum 2 and contained more moisture. The base of the hard pan occurred at 120 cm and was marked by a slight change in color (dark brown - 10YR4/3).

Cultural materials were concentrated in the first 6 levels, where they averaged about 47 items, but were much less abundant than in Test Unit 1. Level 1 (0 cm - 10 cm) yielded 1 secondary decortication flake, 2 interior flakes, 2 retouch flakes, 1 piece of chert shatter, 1 biface fragment, 16 pieces of fire-cracked sandstone, 2 pieces of unmodified sandstone, 1 fragment of unidentified lithic cortex and a fragment of mussel shell. Level 2 (10 cm - 20 cm) yielded 2 secondary decortication flakes, 1 retouch flake, 1 interior flake, 1 piece of chert shatter and 16 pieces of unmodified sandstone. Level 3 (20 cm - 30 cm) yielded 1 primary decortication flake, 2 secondary decortication flakes, 5 interior flakes, 9 retouch flakes, 6 pieces of chert shatter and 20 pieces of unmodified sandstone. Level 4 (30 cm - 40 cm) yielded 1 secondary decortication flake, 3 interior flakes, 6 retouch flakes, 3 pieces of chert shatter, 10 pieces of fire-cracked sandstone, 4 pieces of fire-cracked chert, 4 pieces of unmodified sandstone and 1 piece of burned clay. Level 5 (40 cm - 50 cm) yielded 2 secondary decortication flakes, 11 interior flakes, 15 retouch flakes, 5 broken flakes, 2 pieces of fire-cracked sandstone, 4 pieces of unmodified chert and 21 pieces of unmodified sandstone. Level 6 (50 cm - 60 cm) yielded 1 secondary decortication flake, 33 interior flakes, 20 retouch flakes, 40 pieces of fire-cracked sandstone, 3 pieces of fire-cracked chert and one fragment of a ground stone tool. Artifact content declined dramatically below 60 cm. Level 7 (60 cm - 70 cm) yielded 6 retouch flakes, 3 broken flakes and 2 pieces of unmodified sandstone. Level 8 (70 cm - 80 cm) yielded a single piece of sandstone. All levels below 80 cm were culturally sterile, although level 11 (100 cm - 110 cm) yielded a piece of unmodified sandstone.

Test Unit 3 was placed at 30S/20E on the east slope of the ridge in an area of relatively high surface artifact density and excavated in 10 cm levels to a depth of 60 cm where a posthole test was excavated an additional 50 cm to 110 cm. The unit was stepped down to 1 m x 1 m (north half) in level 6 (50 cm - 60 cm) due to the sharply diminished numbers of artifacts and the compactness of the soil that made excavating and screening difficult. No evidence of features was found during the excavation of this unit (Photographs 1 and 2).

TEST UNIT 2 WEST WALL PROFILE

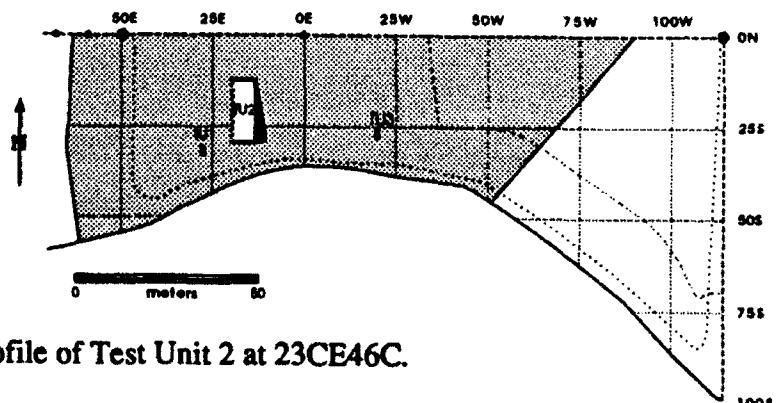
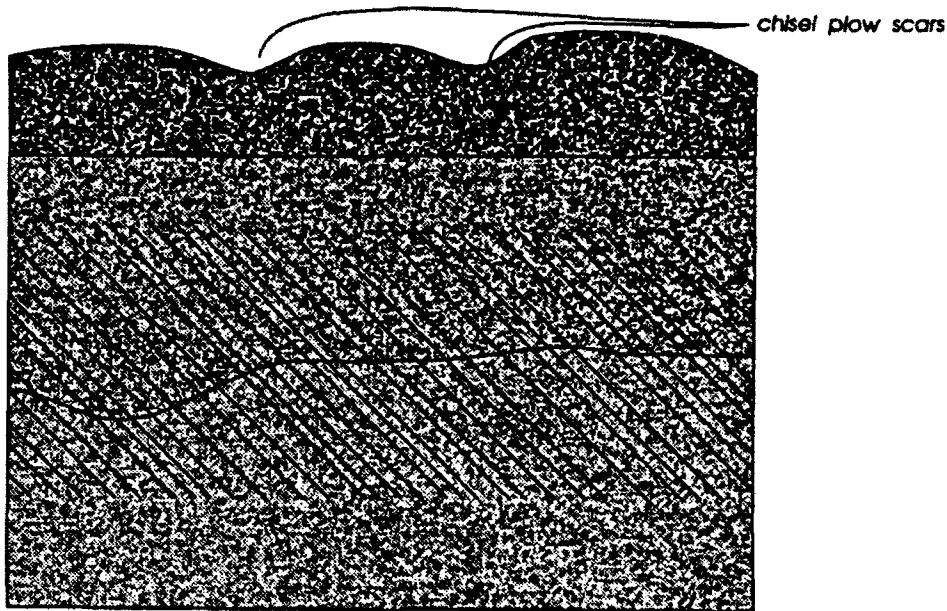


Figure 9. Profile of Test Unit 2 at 23CE46C.



Photograph 1. Excavation of Test Unit 3 at 23CE46C.



Photograph 2. Completed excavation of Test Unit 3 at 23CE46C.

Three strata were revealed in Test Unit 3 (Figure 10). Stratum 1 was a dark yellowish brown (10YR3/4) silt loam that normally extended to 15 cm except where disturbed by chisel plowing where it reached as deep as 44 cm. Stratum 2 was a dark yellowish brown (10YR4/4) silt loam reached a depth of about 50 cm. Cultural materials ceased to be present at about the base of the stratum. Stratum 3 was a very dark grayish brown (10YR3/2) silt loam that became lighter in color with depth and yielded no cultural materials.

Cultural materials were relatively abundant in Test Unit 3, averaging about 76 items per level, but were concentrated in the upper 30 cm of the unit. Level 1 (0 cm - 10 cm) yielded 4 interior flakes, 2 retouch flakes, 1 piece of chert shatter, 30 pieces of fire-cracked sandstone, 3 pieces of fire-cracked chert, 6 pieces of unmodified sandstone, one piece of cortex from an unidentified stone, 7 pieces of coal and 1 piece of unidentified charcoal. Level 2 (10 cm - 20 cm) yielded 2 secondary decortication flakes, 2 interior flakes, 4 retouch flakes, 3 broken flakes, 13 pieces of chert shatter, 57 pieces of fire-cracked sandstone, 12 pieces of fire-cracked chert, 50 pieces of unmodified sandstone and 103 pieces of what appears to be coal. Level 3 (20 cm - 30 cm) yielded 1 primary decortication flake, 2 interior flakes, 13 pieces of fire-cracked sandstone, 12 pieces of unmodified sandstone and 36 pieces of coal. Below Level 3, artifact density dropped dramatically. Level 4 (30 cm - 40 cm) yielded 1 secondary decortication flake, 7 pieces of fire-cracked chert and 7 pieces of unmodified sandstone. Level 5 (40 cm - 50 cm) yielded a single piece of fire-cracked sandstone. All levels below 50 cm were culturally sterile.

Horizontal and Vertical Extent - 23CE46C occupies about 6,500 m² of Tract 2508E2. Its western limit is defined by a previous channel of the Sac River with cultural materials occurring about half way down the west slope of the ridge, as revealed by posthole test 1. The eastern limit is defined by the surface distribution of artifacts and extends along a line roughly between 0N/100E and 40S/65E. The minor cluster of materials in the southeastern part of the collection grid, which totals only 21 primarily nondescript items such as burned or unmodified sandstone, does not warrant the extension of the site boundaries further east. The southern boundary of the site is marked by the Sac River, but the northern boundary could not be defined on the basis of our investigations. The depth of the deposits at 23CE46C is highly variable, ranging from 50 cm in Test Unit 3, to 80 cm in Test Unit 2, to 160 cm in Test Unit 1.

Cultural Affiliation - Precious little information was recovered that would enable an assessment of the cultural components present at 23CE46C. As with most of the sites investigated during this project, this site is frequently visited by amateur collectors that has resulted in a loss of most of the artifacts useful in making temporal assignments. None-the-less some indications were recovered. 23CE46C was occupied during the Late Archaic Period (3000 BC - 1000 BC) based on the Table Rock variant point, during the Late Woodland Period (AD 400 - AD 900) based on the Scallorn-like point and during the Early Mississippi Period (AD 900 - AD 1200) based on the Table Rock Pointed Stem point.

Site Function - 23CE46C represents the results of repeated specialized activities focusing on hunting and food preparation. Activities suggested by the artifacts recovered include cutting/cleaving, hunting/butchering, food preparation, stone tool manufacture and maintenance and refuse disposal.

TEST UNIT 3 WEST WALL PROFILE

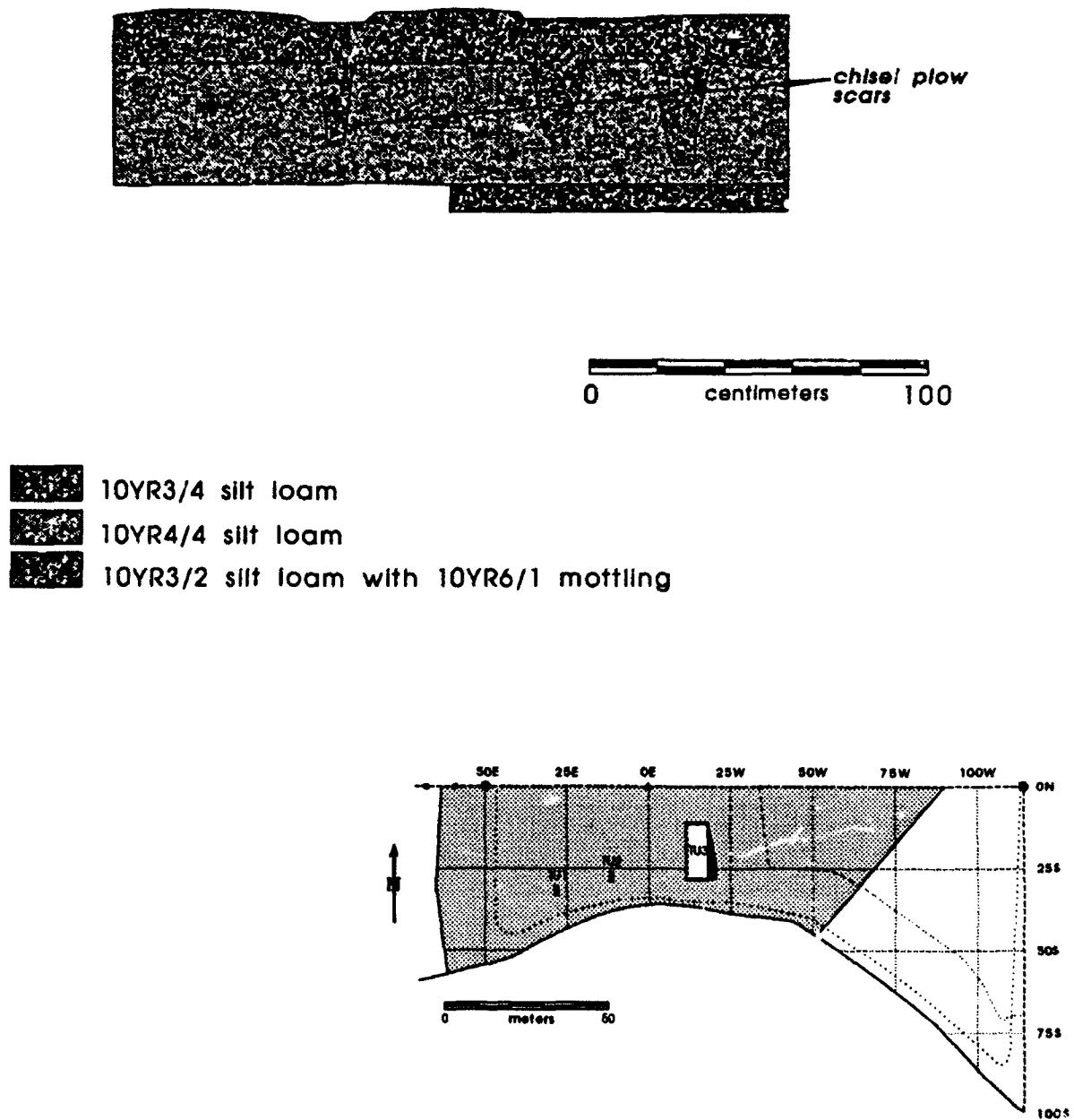


Figure 10. Profile of Test Unit 3 at 23CE46C.

Site Integrity - 23CE46C has suffered damage from clearing, cultivating, surface erosion and, most importantly, from river migration that appears to be rapid and has the potential to completely destroy the site. Mapping of the easement and river bank, when compared to the 1:4,800 scale topographic maps provided by the Kansas City District shows that the river has eroded away approximately 30 m of the site since the KCD map was drawn. Never-the-less, our excavations suggest that undisturbed deposits exist at the site. A probable trash pit was found at 45 cm in Test Unit 1, as well as a buried component between 130 cm and 150 cm. Although artifacts were sparse (N= 8), a large amount of burned clay (1,766.6 g) was present and a phosphate test, which produced the highest level of phosphorous (15 ppm) seen during the project, may indicate that a substantial occupation occurred at that level and that our excavation may have only encountered an area of low artifact density.

Significance Assessment - 23CE46C contains data that make it eligible for inclusion in the National Register of Historic Places under criterion D. Intact cultural deposits are present, as well as a buried cultural component. Data relating to Late Archaic, Late Woodland and Early Mississippi Period use of the Sac River Valley are present at the site. Previous excavations in the Sac River Valley have largely concentrated on shelters and sites with burial mounds. As a result, little is known of floodplain sites and their relation to other kinds of sites in the area. In addition, basic cultural chronologies have yet to be established in the Sac drainage, making sites exhibiting intact deposits doubly important. Additional work in the form of bank stabilization or data recovery is recommended.

23CE439

23CE439 is located on the northeast side of an outer bend of the Sac River (Figure 11). It is within Tract 2506E and extends northward an unknown distance. 23CE437 is reported to be at a depth of about 3 m in an abandoned river channel approximately 90 m west of 23CE439. 23CE438 is reported to be at a depth of 4.5 m beneath the surface of 23CE439. Within the limits of the COE easement, surface materials are located on a slight rise that appears to be a natural levee formed by a previous river channel. Most of the area is under cultivation but a portion of it is located in a narrow wooded band between an existing field road and the river. The riverbank is actively eroding, beginning roughly at the boundary between Tracts 2505E and 2506E, but is slowed by riverbank vegetation and the gentle river geometry near the site. At the time of our investigations, the cultivated portion of the site had been recently disced, affording 100% surface visibility. Surface visibility in the wooded part of the site was 0%.

Our work began on 28 March and was completed on 17 April 1991. The boundaries of the easement were first resurveyed to confirm that we were in the correct location and to establish the limits of our work area. By using the original survey notes and topographic maps provided by the Kansas City District, we relocated and marked, where necessary, COE survey markers 46, 46A, 47, 48, 49 and 50. Markers 46 and 50 were clearly marked on the ground and were easily relocated. Marker 46 served as the site datum. Subsequent investigations included a controlled surface collection and the excavation of 8 1 m x 2 m test units. As a result, 357 items (Table 11), both cultural and non-cultural, were recovered as well as information on the nature and extent of the cultural deposits.

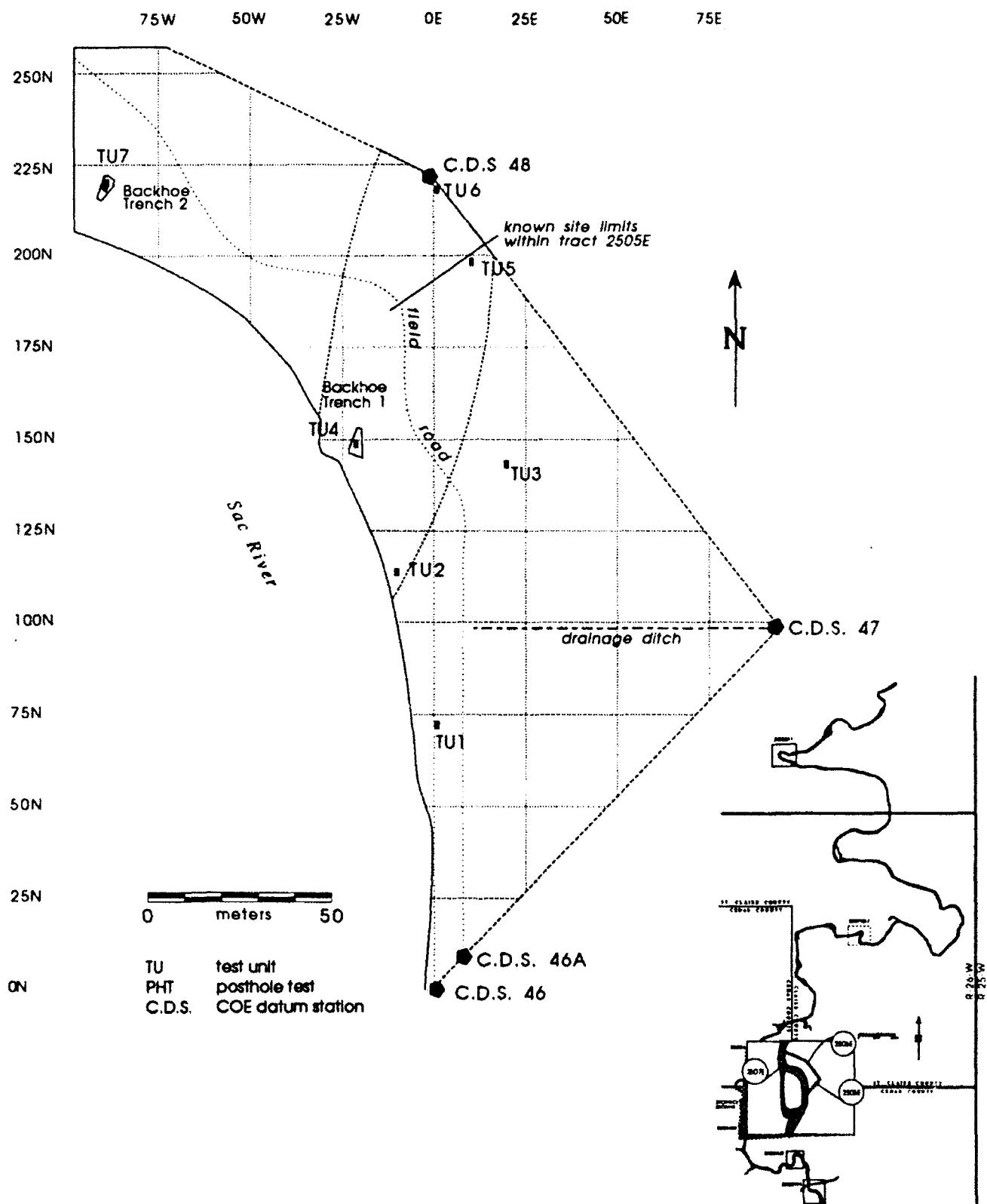


Figure 11. HPA investigations at 23CE439.

Table 11. Artifacts from 23CE439.

Artifact Description	Ct	Wt (g)			
Arrow point (Scallorn)	1	1.7	Flake, interior	19	45.4
Arrow point tip	2	0.2	Flake, primary decort	2	3.4
Biface fragment	1	8.2	Flake, retouch	9	1.5
Bone, bovine	1	5.1	Flake, secondary	4	15.7
Charcoal, unidentified	121	14.5	decort		
Cobble, tested	1	35.0	Metal, unidentified	3	3.0
Dart point (Gibson)	1	16.2	Sandstone	176	1887.2
Fire-cracked rock	2	17.4	Shatter	13	64.3
Flake, broken	1	0.5	Total	357	2119.3

Because surface materials were sparse, it was possible to flag surface artifacts and plot their location with a transit rather than establishing a collection grid. One hundred twelve artifacts were plotted (Figure 12) but only potential cultural diagnostics and tools were collected. The analysis of the surface collections shows that the areas of highest artifact density are on the crest of the ridge upon which the site is situated. Fairly limited down slope movement of artifacts due to erosion is evident. A Scallorn-like arrow point (Cat. No. 1-1) was found at 189.12N/16.6E (Surface Plot 1). This tool is manufactured from heat-treated Burlington chert, weighs 1.7 g and measures 2.91 cm x 1.45 cm x .5 cm. The point is corner-notched, has a thick blade and a straight base. Scallorn points date to the Late Woodland Period (AD 400 - AD 900).

An arrow point tip (Cat. No. 3-1) was found at Surface Plot 42. The point is made from Burlington chert, weighs .2 g and measures 1.1 cm x .6 cm x .2 cm. Although probably late in time, this artifact cannot otherwise be dated. A second arrow point tip (Cat. No. 5-1) was found at 193.57N/2.6W (Surface Plot 48). This tip was manufactured from heat-treated Burlington chert, weighs .1 g and measures .88 cm x .7 cm x .15 cm. This tip is also representative of late activities, but cannot otherwise be dated. An unhafted biface fragment (Cat. No. 4-1) was found at 184.52N/2.85E (Surface Plot 44). This biface is manufactured from Jefferson City/Cotter undifferentiated chert Variety 4, weighs 8.2 g and measures 3.4 cm x 2.4 cm x 1.0 cm. It is likely that this tool was broken during the reduction process and cannot be dated.

Seven 1 m x 2 m test units were established at grid coordinates 73.41N/1.67E, 115N/9W, 145N/20E, 150N/21W, 200N/10E, 220N/0e and 220N/9W. Because surface materials were so sparse, only Test Units 5 (200N/10E) and 6 (220N/0E) could be placed in areas of relatively high artifact density. Test Units 1 (73.41N/1.67E), 2 (115N/9W) and 4 (150N/21W) were placed in the wooded part of the site where surface materials were not visible and Test Unit 3 (145N/20E) was placed in an area of low surface artifact density. Test Unit 7 (220N/90W) was placed on 23CE437. These were excavated in 10 cm levels by troweling and shovel skimming. Excavated soil was screened through ¼ inch mesh hardware cloth and the cultural materials recovered placed in paper nail bags labeled with the site number, test unit number, level number, date and the initials of the excavator and screener. Excavation proceeded until a culturally sterile level was encountered, at which point a posthole test was excavated an additional 50 cm in 10 cm levels to confirm that the base of the deposits had been reached. Upon completion, one wall was drawn in profile and photographed in black and white and color slides.

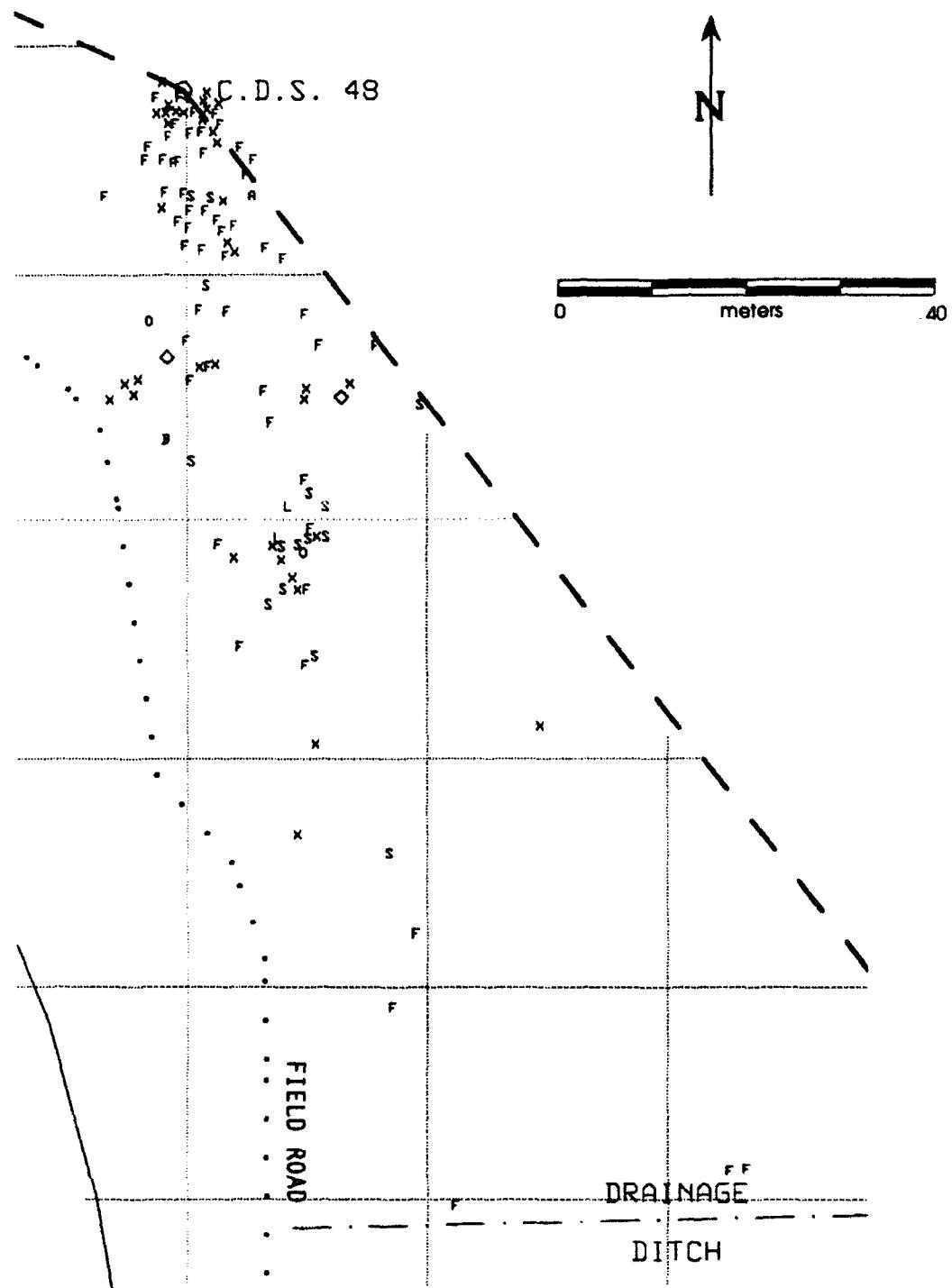


Figure 12. Surface artifacts at 23CE439.

Test Unit 1 was placed at 73.41N/1.67E in a wooded area next to a part of the plowed field devoid of surface artifacts. It was excavated to a depth of 20 cm where a posthole test was excavated an additional 40 cm to 60 cm. No cultural materials were recovered. Two strata were revealed in Test Unit 1 (Figure 13). Stratum 1 was a very dark grayish brown (10YR3/2) silt loam that extended to 30 cm. Stratum 2 was a dark brown (10YR3/3) silt loam that extended to the base of the posthole test.

Test Unit 2 was placed at 115N/9W in a wooded area at the southernmost end of the ridge and excavated in 10 cm levels to a depth of 80 cm where a posthole test was excavated an additional 50 cm to 130 cm. One hundred thirty-two items were recovered. The most commonly occurring items were unidentified charcoal (about 79% of all recovered materials) and unmodified sandstone (about 17%), neither of which are definitely cultural. Other items included a piece of chert shatter and 3 interior flakes. Level 8 (70 cm - 80 cm) was culturally sterile, as was the posthole test. Two strata were revealed in Test Unit 2 (Figure 14). Stratum 1 was a very dark grayish brown (10YR3/2) silt loam that extended to 40 cm to 52 cm. The boundary between it and the underlying stratum was irregular. Stratum 2 was a dark brown (10YR3/3) silt loam that exhibited light brownish gray (10YR6/2) mottling below 90 cm.

Test Unit 3 was placed at 145N/20E in an area of low surface artifact density and excavated in 10 cm levels to a depth of 30 cm where a posthole test was excavated an additional 50 cm to 80 cm. One piece of unmodified sandstone was recovered from Level 1 (0 cm - 10 cm). Three strata were revealed in Test Unit 3 (Figure 15; Photograph 3). Stratum 1 was a dark grayish brown (10YR4/2) silt loam that extended to 20 cm. Stratum 2 was a dark grayish brown (10YR4/2) silt loam that reached a depth of about 60 cm. Stratum 3 was a dark gray (10YR4/1) fine sandy loam with strong brown (7.5YR4/6) concretions.

Test Unit 4 was placed in a wooded area at 150N/21W next to a former channel of the Sac River. It was excavated in 10 cm levels to a depth of 90 cm where a posthole test was excavated an additional 50 cm to 140 cm. One hundred items were recovered, including 17 pieces of charcoal, a Gibson Point, 2 pieces of fire-cracked rock, 1 broken flake, 3 interior flakes, 1 secondary decortication flake, 67 pieces of sandstone and 8 pieces of chert shatter. Seventy-six of these were recovered from levels 4 through 6 (30 cm - 60 cm). Among these was a Gibson point (Cat. No. 18-3), recovered from level 4. This dart point is manufactured from heat-treated Burlington chert, weighs 16.5 g and measures 5 cm x 2.92 cm x 1.2 cm. The blade is thick and narrow, has been bifacially resharpened and shows no use-wear. Gibson points are associated with the Middle Woodland Period (500 BC - AD 400).

Subsequently, a backhoe trench was excavated in the location and the unit reestablished as a 1 m x 1 m square at a depth of 440 cm to test for the presence of a buried deposit previously recorded as 23CE438. Two 10 cm levels were excavated to a depth of 460 cm where a posthole test was excavated an additional 50 cm to 510 cm. A portion of the east wall of the backhoe trench was profiled, revealing 6 strata (Figure 16). Stratum 1 was a dark grayish brown (10YR4/2) silt loam that extended to a depth of about 42 cm. Stratum 2 was a brown to dark brown (10YR4/3) silt loam that extended to 78 cm. Stratum 3 was a dark brown (10YR3/3) fine sandy loam that extended to 100 cm. Stratum 4 was a dark brown (10YR3/3) silt that extended to 200 cm.

TEST UNIT 1 WEST WALL PROFILE

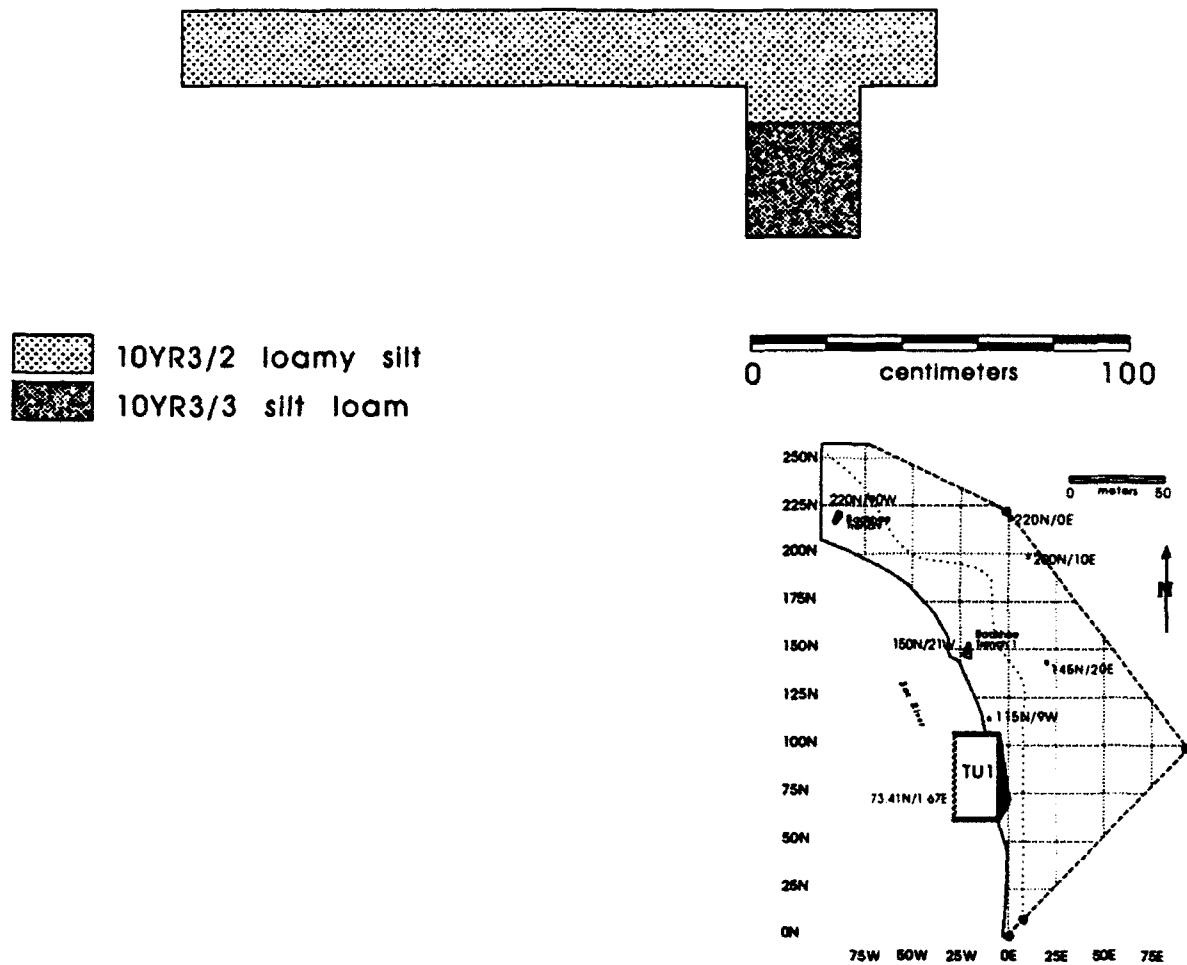


Figure 13. Profile of Test Unit 1 at 23CE439.

TEST UNIT 2 WEST WALL PROFILE

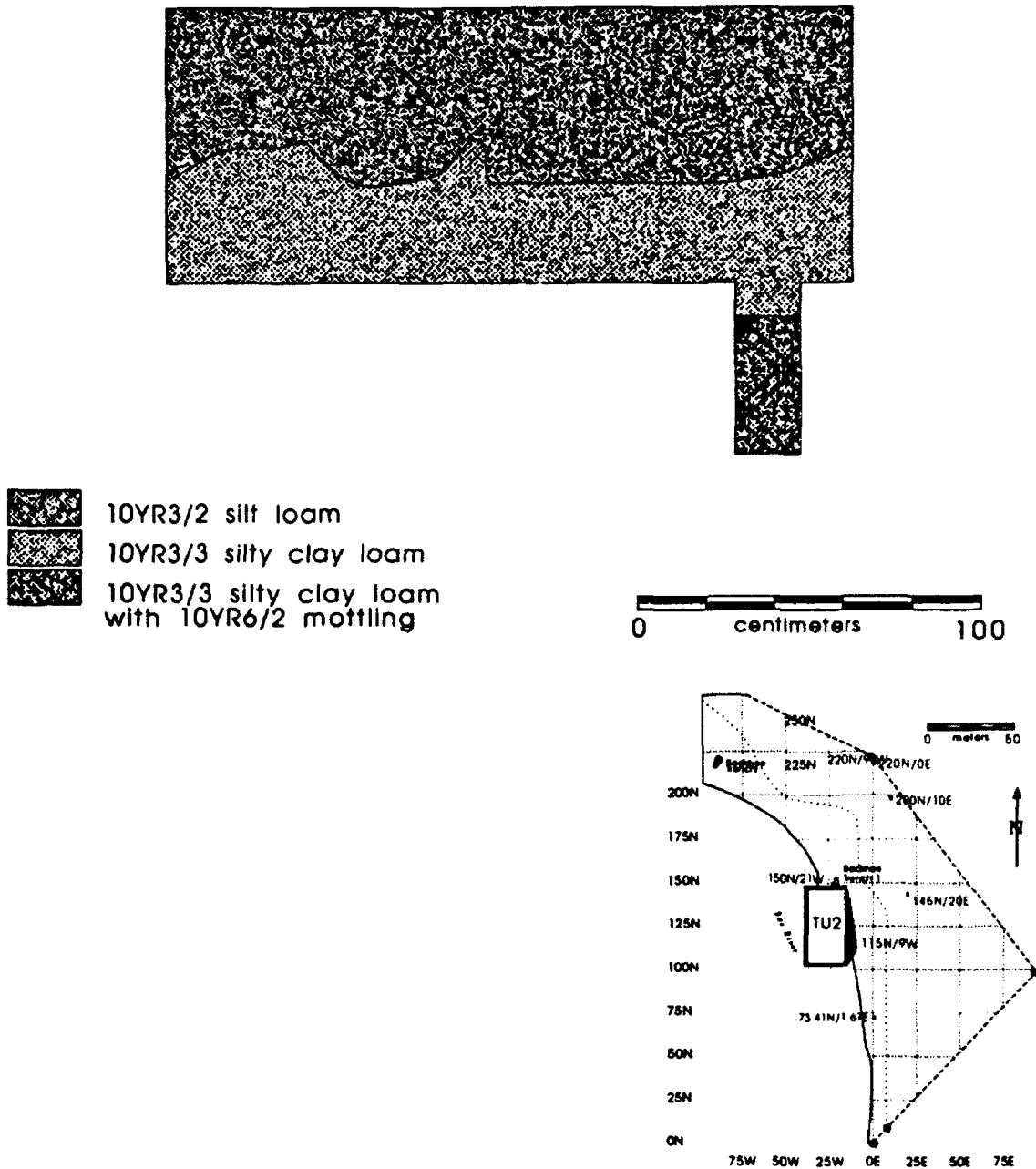


Figure 14. Profile of Test Unit 2 at 23CE439.

TEST UNIT 3 WEST WALL PROFILE

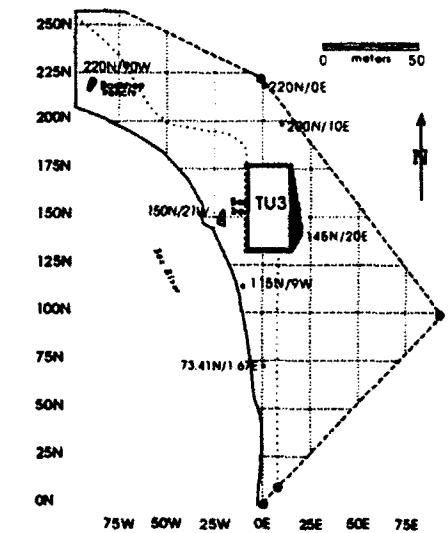
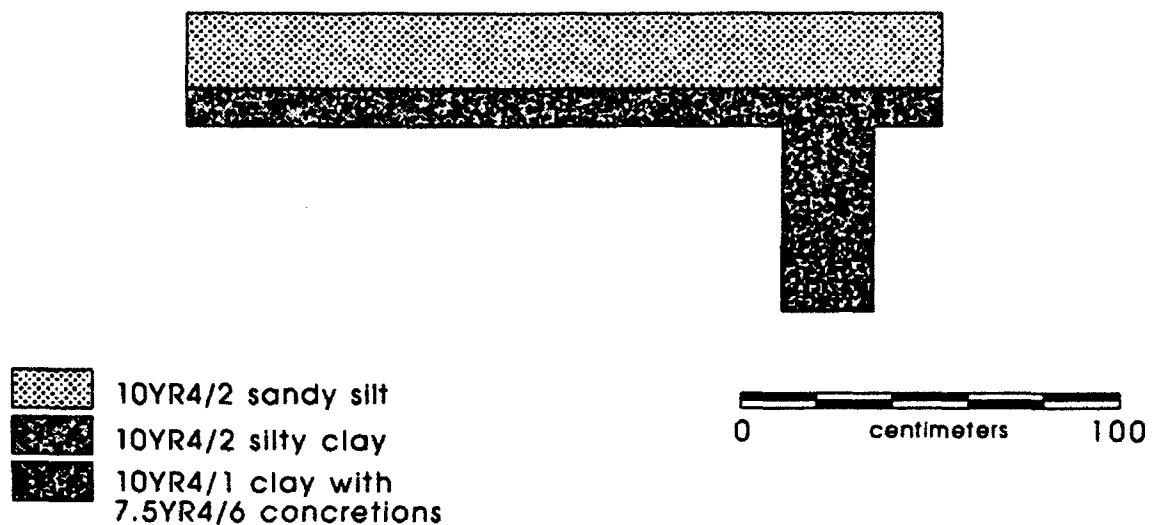


Figure 15. Profile of Test Unit 3 at 23CE439.



Photograph 3. Completed excavation of Test Unit 3 at 23CE439.

TEST UNIT 4 AND BACKHOE TRENCH 1 EAST WALL PROFILE

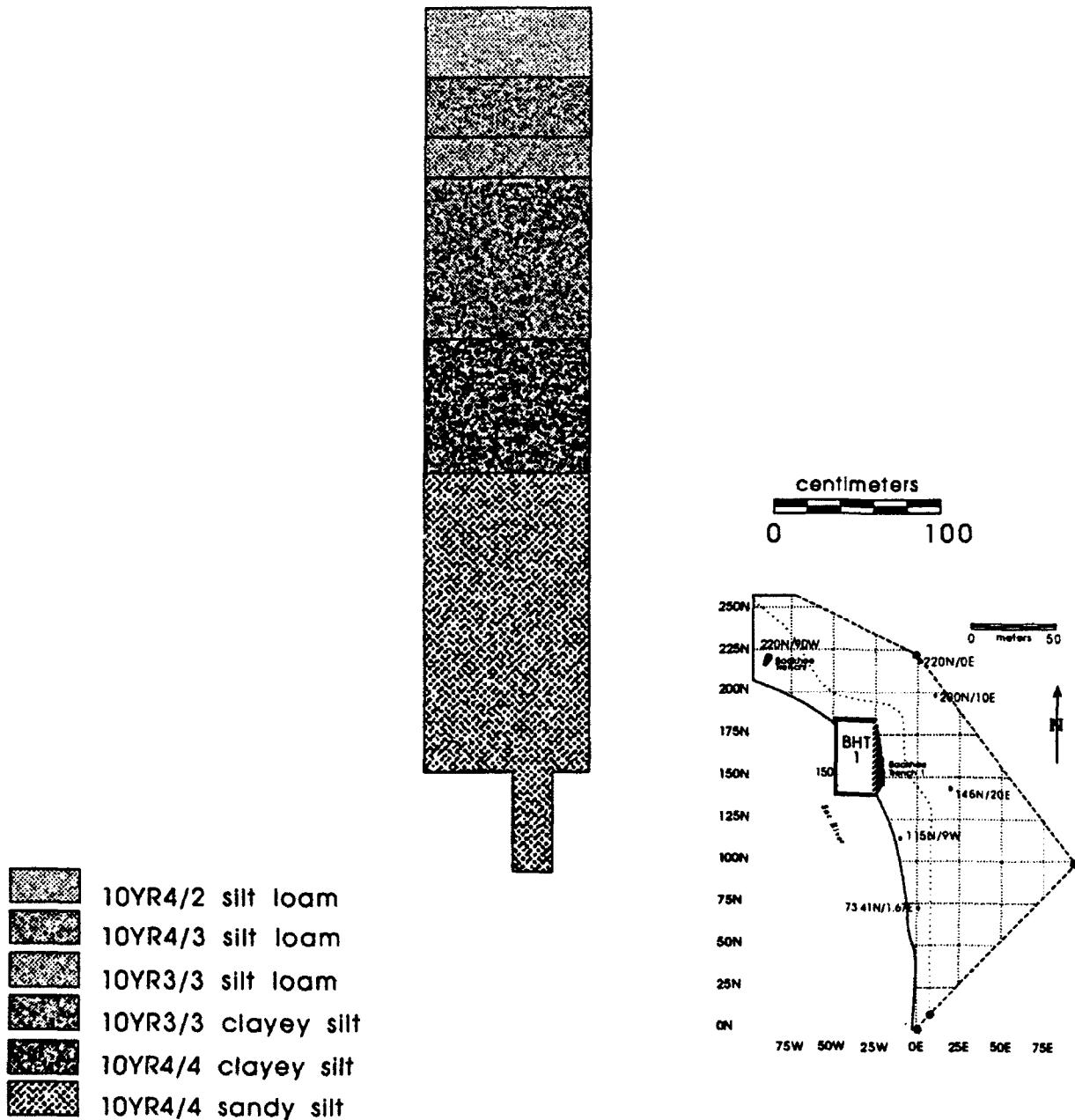


Figure 16. Profile of Test Unit 4 and Backhoe Trench 1 at 23CE439.

Stratum 5 was a dark yellowish brown (10YR4/4) fine sandy loam that extended to 280 cm. Stratum 6 was a dark yellowish brown (10YR4/4) loam that graded imperceptibly into a sandy silt by 440 cm. No cultural materials were recovered from the deep test.

Test Unit 5 was placed on the crest of the ridge at 200N/10E next to an area of moderate surface artifact density. It was excavated in 10 cm levels to a depth of 90 cm where a posthole test was excavated an additional 50 cm to 140 cm. Forty-two items were thinly scattered to a depth of 80 cm, including: 3 interior flakes, 2 retouch flakes, 1 secondary decortication flake, 30 pieces of sandstone, 3 pieces of chert shatter and 3 pieces of unidentified metal. Five strata were detected during excavation (Figure 17). Stratum 1 was a dark brown (10YR3/3) fine sandy silt that reached a depth of about 20 cm. Stratum 2 was a dark brown (10YR3/3) silt that normally extended to 42 cm but went as deeply as 63 cm in one place. The boundary between strata 2 and 3 was irregular but well defined. Stratum 3 was a dark grayish brown silt loam that reached a normal depth of 80 cm but only penetrated to 68 cm at the south end of the profile. Stratum 4 was a dark yellowish brown (10YR3/4) fine sandy loam that reached a depth of 117 cm. Stratum 5 was a dark brown (7.5YR3/4) fine sandy loam that extended to the base of the posthole test.

Test Unit 6 was placed at 220N/0E in an area of moderate surface artifact density and excavated in 10 cm levels to a depth of 90 cm where a posthole test was excavated an additional 50 cm to 140 cm. Seventy-six items were recovered to a depth of 80 cm, including 1 tested cobble, 9 interior flakes, 2 primary decortication flakes, 7 retouch flakes, 2 secondary decortication flakes, 54 pieces of sandstone and 1 piece of chert shatter. Fifty-five of these items (72%) were recovered from levels 1 and 2 (0 cm - 20 cm). Three strata were revealed during excavation (Figure 18). Stratum 1 was a very dark grayish brown (10YR3/2) silt loam that extended to depths of 20 cm to 30 cm. Stratum 2 was a dark brown silt loam that extended to about 120 cm. Stratum 3 was a brown to dark brown (10YR4/3) fine sandy loam that extended beyond the base of the posthole test.

Test Unit 7 was placed at 220N/90W in a wooded area to test for 23CE437, which had been previously recorded as a site buried at a depth of about 3 m in an abandoned channel of the Sac River. Before excavating with the backhoe, the test unit was excavated in 10 cm levels to a depth of 30 cm to confirm that no shallow deposits were located in the area. A trench was then mechanically excavated to a depth of 260 cm (but 290 cm below the elevation of the river bank) and the test unit reestablished. Hand excavation then proceeded in 10 cm levels to a depth of 290 cm where a posthole test was excavated an additional 50 cm to 340 cm. No cultural materials were recovered from Test Unit 7. Five strata were revealed in the backhoe trench (Figure 19). Stratum 1 was a dark brown (10YR3/3) silt loam that reached a depth of 44 cm. Stratum 2 was a very dark grayish brown sandy silt loam that extended from 44 cm to 114 cm. Stratum 3 was a dark yellowish brown (10YR4/4) fine sandy loam that extended to 134 cm. Stratum 4 was a brown to dark brown (10YR4/3) silt that extended to 330 cm. Stratum 5 was a brown to dark brown (10YR4/3) gravelly sandy loam that extended to the base of the posthole test and probably represents the bed of the former river channel.

TEST UNIT 5 WEST WALL PROFILE

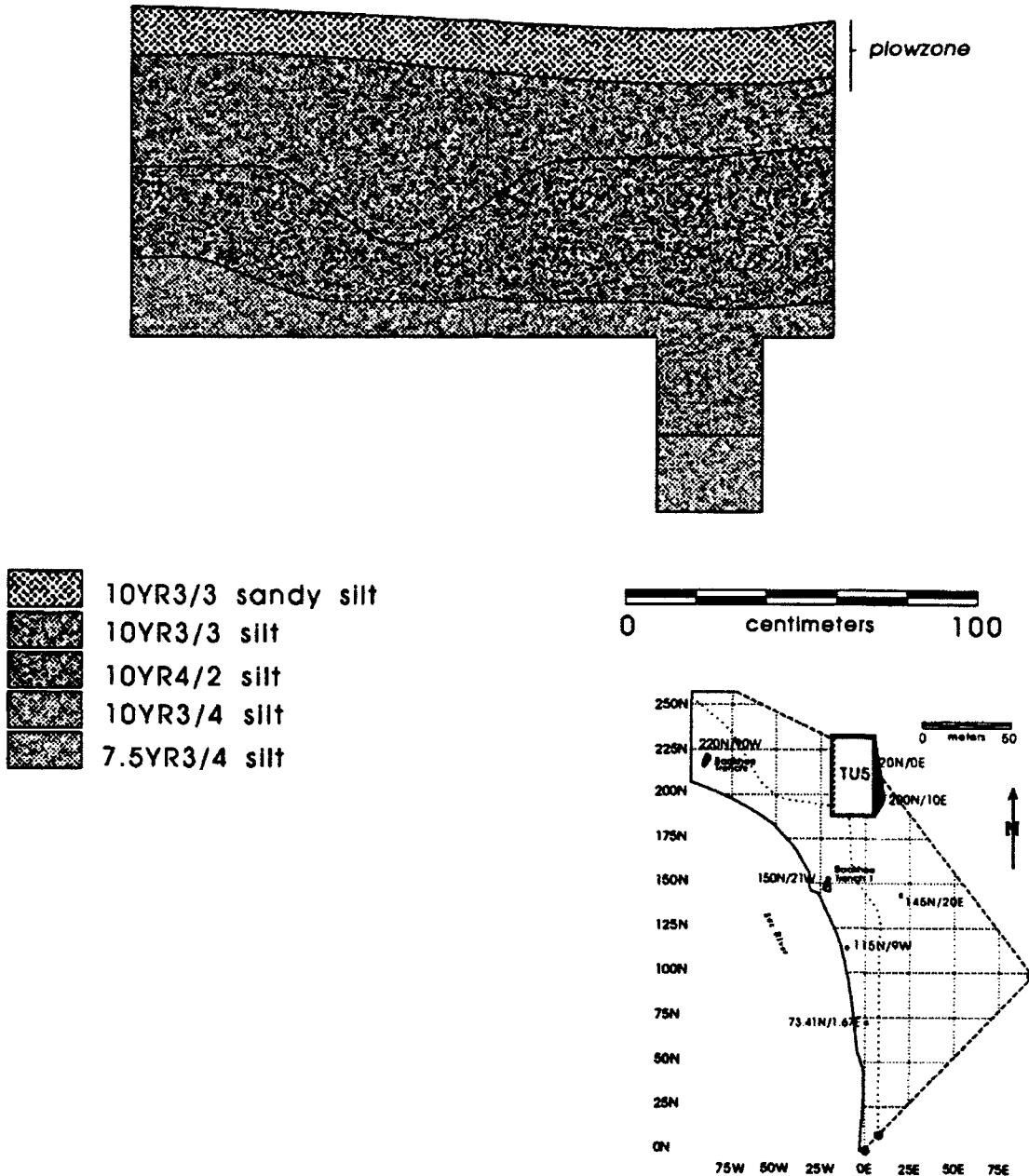


Figure 17. Profile of Test Unit 5 at 23CE439.

TEST UNIT 6 WEST WALL PROFILE

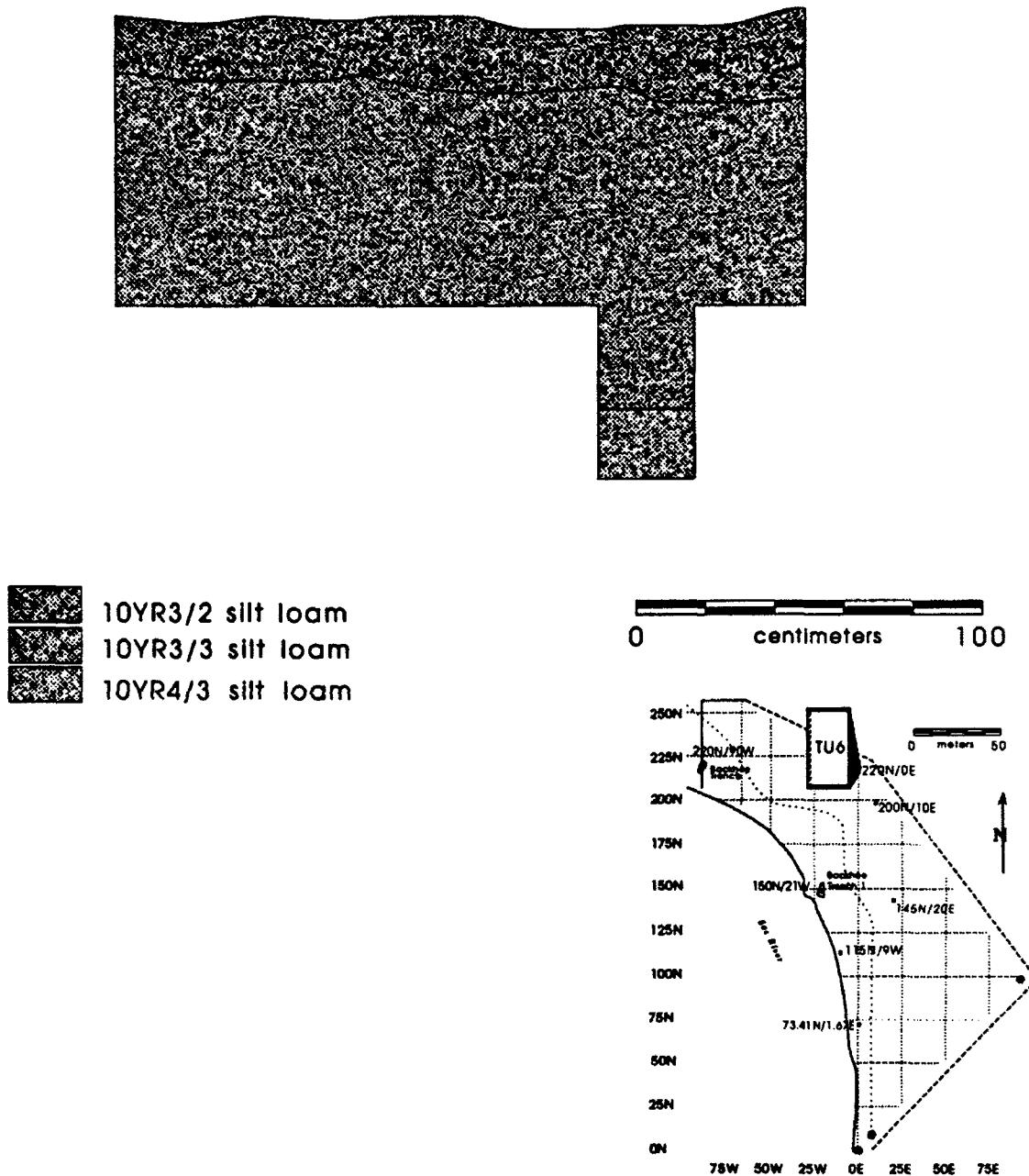


Figure 18. Profile of Test Unit 6 at 23CE439.

TEST UNIT 7 WEST WALL PROFILE

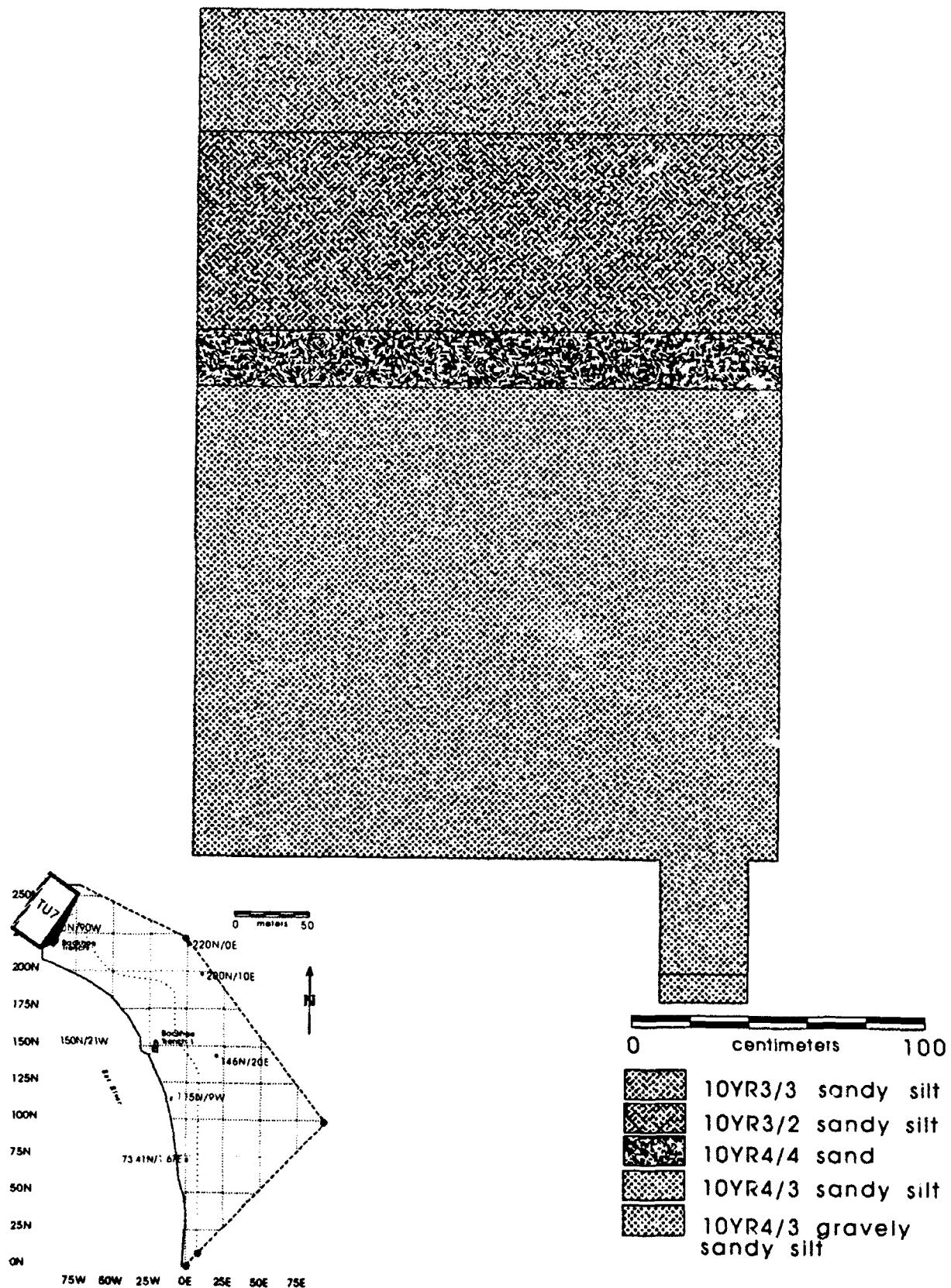


Figure 19. Profile of Test Unit 7 at 23CE439.

Horizontal and Vertical Extent - 23CE439 occupies about 3,600 m² of Tract 2506E in a narrow band that parallels the ridge. Its western limit is defined by a previous channel of the Sac River. The eastern limit is defined by the surface distribution of artifacts. The southern boundary of the site is near Test Unit 2, but the northern boundary could not be defined on the basis of our investigations. The depth of the deposits at 23CE439 is consistently 70 cm to 80 cm in the 4 test units that yielded cultural materials (Test Units 2, 4, 5 and 6). 23CE437 and 23CE438 remain a problem, since we were unable to confirm their presence with controlled excavations or inspection of the river bank. These sites may have been destroyed by river meandering or the materials originally observed may have been redeposited on the cutbank from 23CE439 and mistaken as deeply buried cultural remains. 23CE438, if it still exists, may be properly considered as a component of 23CE439, but 23CE437 is spatially separate and should not be lumped with 23CE439. It is also possible that 23CE437 is composed of redeposited materials, since it was recorded in an abandoned river channel.

Cultural Affiliation - Little information was recovered that would enable an assessment of the cultural components present at 23CE439. As with most of the sites investigated during this project, this site is frequently visited by amateur collectors that has resulted in a loss of most of the artifacts useful in making temporal assignments. At a minimum, 23CE439 was occupied during the Middle Woodland Period (500 BC - AD 400) as evidenced by the Gibson point found in Test Unit 4 and the Late Woodland Period (AD 400 - AD 900) as evidenced by the Scallorn point found on the surface.

Site Function - Activities suggested by the artifacts recovered include refuse disposal, hunting and butchering, cutting/cleaving, food preparation, stone tool manufacture and maintenance. Phosphate testing of soil samples from each stratum identified in Backhoe Trench 1 consistently found levels of phosphorous below 1.5 ppm and argues against the disposal of large amounts of organic refuse. The activities suggested by the artifacts, in combination with the generally sparse artifact density and an absence of indicators of long-term habitation, such as structural remains and midden accumulation, indicate that the site functioned as a hunting and/or fishing camp.

Site Integrity - The site has suffered damage from clearing, cultivating, surface erosion and river migration. Our mapping at the site, when compared to the 1:4,800 scale topographic maps provided by the Kansas City District, shows that the river bank in Tract 2506E (particularly in the 23CE437 vicinity) has been eroded away as much as 12 m. Our excavations did not discover evidence of undisturbed deposits or other data that would make the site eligible for inclusion on the National Register. Acidity (pH) testing of soil samples taken from Backhoe Trench 1 shows the soils to be very strongly to extremely acid, conditions that are not amenable to the preservation of fossil pollen or other organic remains. Stratum 1 was less acidic (pH = 5.4, strongly acid) but this stratum would also contain modern pollen. No evidence of deeply buried deposits at 23CE437 or 23CE438 was recovered and these sites may have been destroyed by river meandering.

Significance Assessment. Our investigations at 23CE439 failed to produce data that would make it eligible for inclusion in the National Register of Historic Places. No evidence of intact deposits, in the form of features or in situ artifacts, was found and the site is of a cultural and

functional type that commonly occurs in the Sac River Valley. No rare cultural components were identified and no unusual activities are suggested by the materials recovered. The high soil pH makes it unlikely that organic remains or human burials have been preserved. We note however, that these conclusions apply only to the portion of the site within Tract 2506E, which contains only about 6% of the site. We believe that this is too small a part of the site to draw firm conclusions, particularly since our work took place at the far southern end of the site and may not have tapped the main cultural deposits. If future river bank erosion requires the movement of the existing easement, this site will require reassessment.

23CE442

23CE442 is situated on the north side of an outer bend of the Sac River at the base of a hill that rises about 36 m above the floodplain (Figure 20). The site occupies a narrow band of the floodplain between the river and the hill that, for the most part, is little more than 15 m wide. Vegetation on and surrounding the site is composed of mixed hardwoods and fescue pasture. No cultural materials are visible on the surface, although some can be seen on top of the hill in the field road leading to the site.

Our work took place from 16 to 30 October 1990 and from 16 to 23 April 1991. The easement boundaries were first resurveyed to confirm that we were in the correct location and to establish the work limits. By using the original survey notes and topographic maps provided by the Kansas City District, we relocated COE survey markers 19D and 20B, both of which were clearly marked on the ground and easily relocated. Subsequent investigations included the excavation of 3 1 m x 2 m test units. As a result, 90 items (Table 12), both cultural and non-cultural, were recovered as well as information on the nature and extent of the cultural deposits.

Table 12. Artifacts from 23CE442.

Artifact Description	Ct	Wt (g)			
Charcoal, unidentified		266.6	Grit-tempered plain body	36	248.0
Flake, broken	3	1.6	Ground stone, misc.	1	44.5
Flake, interior	1	1.0	Preform fragment	2	109.1
Flake, retouch	1	0.3	Unmodified stone	45	414.4
Grit-tempered plain base	1	80.5	Total	90	1166.0

Although no surface deposits were present, a few items were recovered from the river bank. A large preform (Cat. No. 1-1) manufactured from Jefferson City/Cotter undifferentiated chert Variety 1 was recovered. This biface weighs 78.3 g and measures 7.21 cm x 4.71 cm x 2.0 cm. Manufacture of this tool was aborted because of relatively poor material in combination with a bad strike. A second preform fragment (Cat. No. 1-3) is manufactured from heat-treated Burlington chert Variety 1, weighs 30.8 g and measures 4.9 cm x 4.09 cm x 1.6 cm. Numerous fossils in the raw material were the probable cause of the break. This tool was used for cutting and possibly skinning as evidenced by significant use-polish along with edge-rounding and crushing. Although we cannot be sure, it is likely that this tool was used during the Woodland Period. In addition, a large, plain, grit-tempered basal sherd (Cat. No. 1-2) from a conical-based vessel was found.

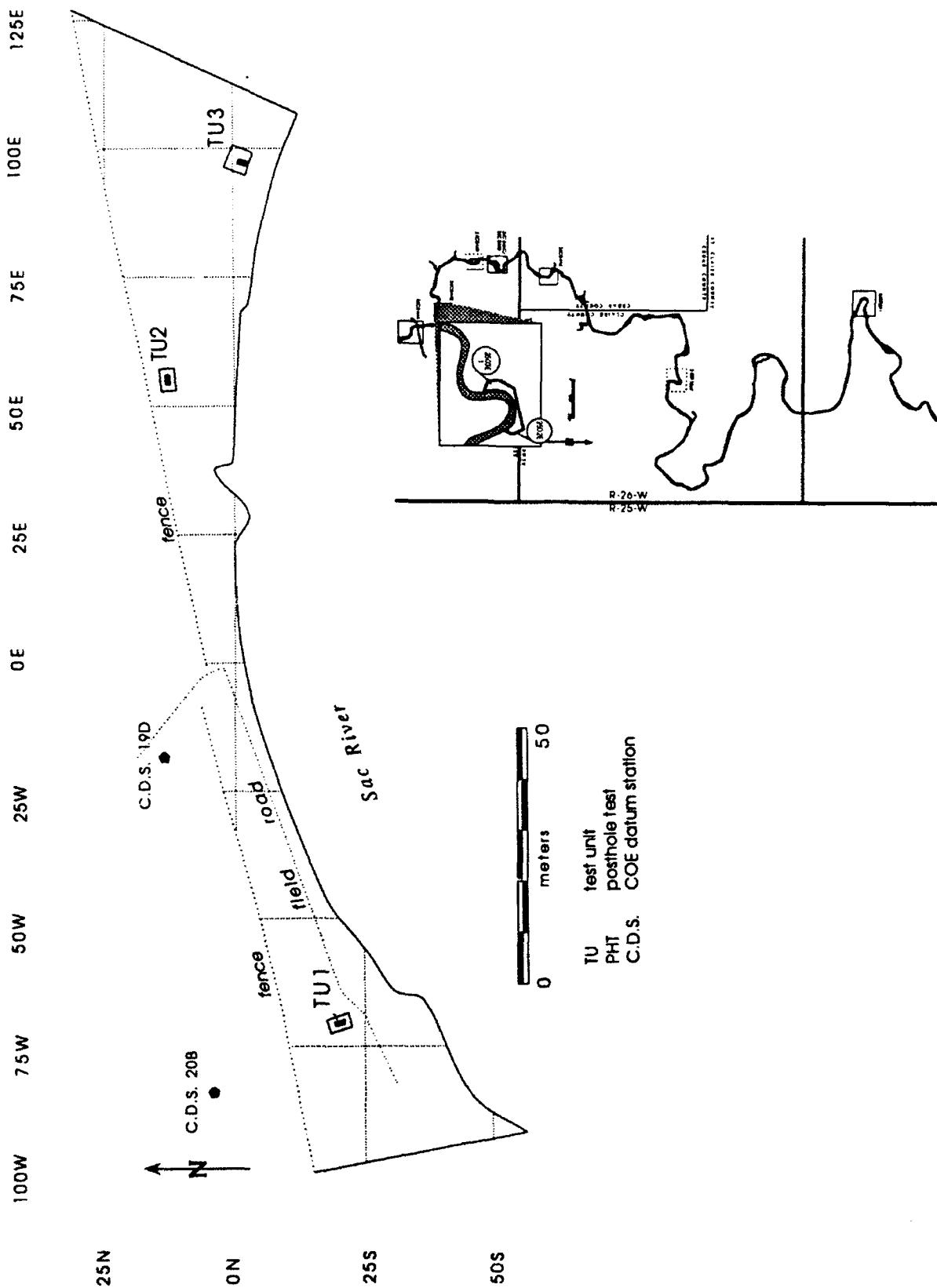


Figure 20. HPA investigations at 23CE442.

Test Unit 1 was placed at 19.79S/73.46W on the north side of a field road that crosses the site. Excavation began at 200 cm and extended to a depth of 290 cm where it was stepped down to 1 m x 1 m and excavated an additional 20 cm. Eighty-three artifacts, 43% of which were plain grog-tempered sherds, were recovered from levels 22 through 30 (210 cm - 300 cm). These included 266.6 g of charcoal, 1 retouch flake, 36 plain grit-tempered body sherds, 1 piece of miscellaneous ground stone and 45 pieces of unmodified lithics. Level 26 (250 cm - 260 cm) yielded 41 artifacts (49% of the total) and, together with levels 27 and 28 (260 cm - 280 cm), accounted for 82% of the artifacts recovered. Below 290 cm, some charcoal was recovered, but no definitely cultural materials were present. Four strata were revealed in Test Unit 1 (Figure 21). Stratum 1 was a dark brown (10YR3/3) silt loam that extended to 55 to 65 cm. Stratum 2 was a brown to dark brown (10YR4/3) silt loam that extended to 144 cm to 156 cm. Stratum 3 was a very dark grayish brown (10YR3/2) silty clay that extended to about 250 cm. Stratum 4 was a dark grayish brown (10YR4/2) silty clay that extended to the base of the excavation.

Test Unit 2 was placed at 14.29N/56E in a pasture at the base of a hill that overlooks the site. Excavation began 176 cm below the surface and proceeded in 10 cm levels to a depth of 250 cm where a posthole test was excavated an additional 80 cm (in 20 cm levels) to 330 cm. At that point water was encountered and excavation terminated. Cultural materials were sparse and nowhere concentrated. Three flakes were recovered from Level 19 (180 cm - 190 cm) and 1 from Level 24 (230 cm - 240 cm). Four strata were revealed in Test Unit 2 (Figure 22). Stratum 1 was a brown (7.5YR4/2) silt loam that extended to 44 cm. Stratum 2 was a brown to dark brown (10YR4/3) silt loam that extended to about 210 cm. Stratum 3 was a moist dark yellowish brown (10YR4/4) silt loam that extended to 238 cm. Stratum 4 was a dark yellowish brown (10YR4/4) fine sandy silt that extended to the base of the posthole test.

Test Unit 3 was placed in the pasture at .55S/100.15E about 5.5 m from the river bank and was located in the area recorded as 23CE443. Before excavating the backhoe trench, 2 10 cm levels were removed (0 cm - 20 cm) to make certain that no shallow deposits were present. Subsequently, a backhoe trench was excavated to a depth 195 cm and Test Unit 3 reestablished at that point. Excavation began at 195 cm and proceeded in 10 cm levels to a depth of 240 cm where a posthole test was excavated an additional 53 cm to 293 cm. No cultural materials were recovered from Test Unit 3. Three strata were revealed in the excavation of Test Unit 3 (Figure 23). Stratum 1 was a dark brown (10YR3/3) silt loam that extended to 65 cm. Stratum 2 was a brown to dark brown (10YR4/3) silt loam that reached a depth of about 146 cm. Stratum 3 was a dark grayish brown (10YR4/2) silty clay that extended to the base of the posthole test.

Horizontal and Vertical Extent - Because 23CE442 is deeply buried and cultural materials are sparse, determining the horizontal extent of the site within the scope and methodology appropriate to a testing project is nearly impossible. Our review of the river bank suggests that EAS's estimate of the extent of the site along the river was reasonably accurate. Our review of the river bank and the excavation of Test Unit 3 failed to confirm that cultural deposits exist near 23CE443. We have no reason to doubt that ESA investigators did, in fact, see artifacts eroding from the river bank, but we were unable to confirm their observations. The deposits at 23CE442 occur between roughly 190 cm and 290 cm below the surface but concentrate within a much smaller zone between 250 cm and 280 cm.

TEST UNIT 1 WEST WALL PROFILE

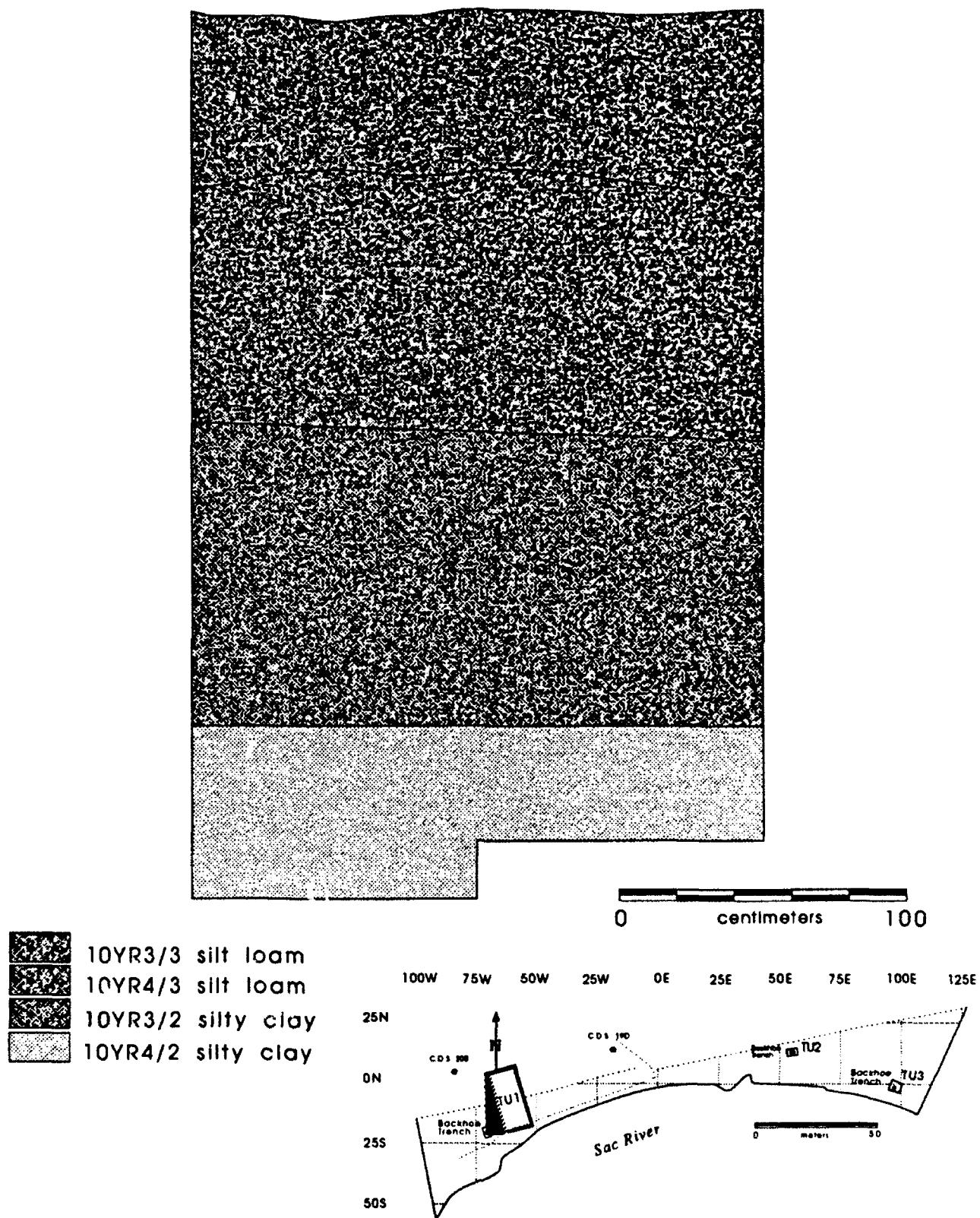


Figure 21. Profile of Test Unit 1 at 23CE442.

TEST UNIT 2 NORTH WALL PROFILE

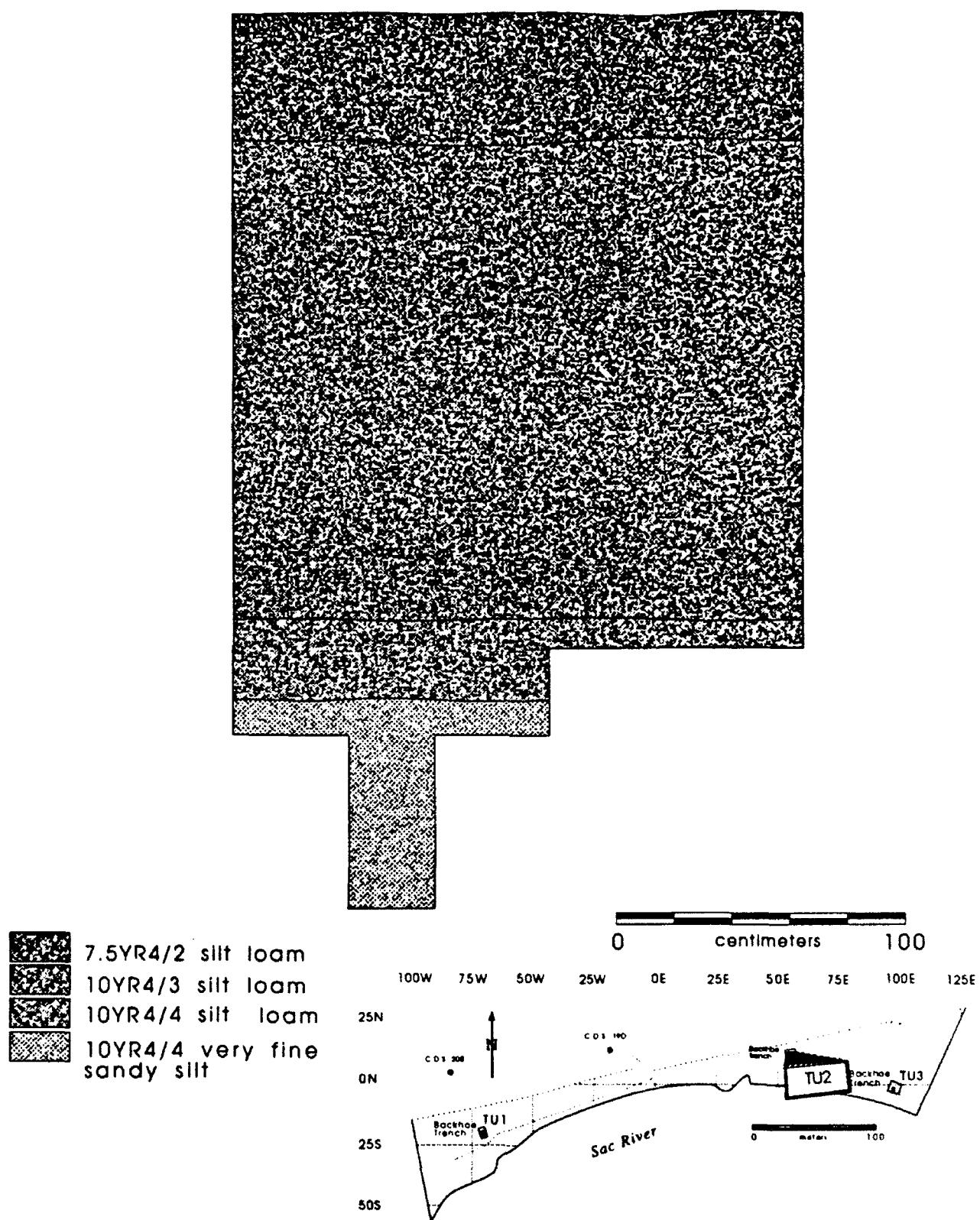


Figure 22. Profile of Test Unit 2 at 23CE442.

TEST UNIT 3 WEST WALL PROFILE

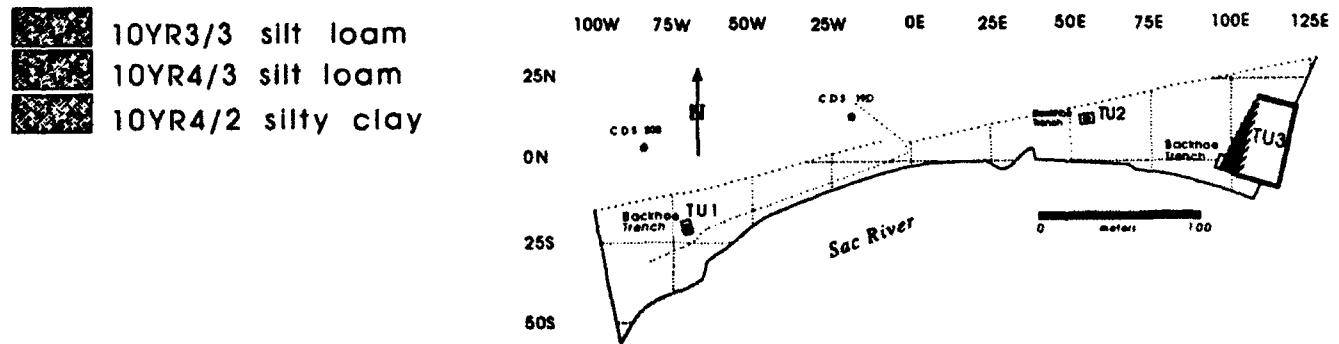
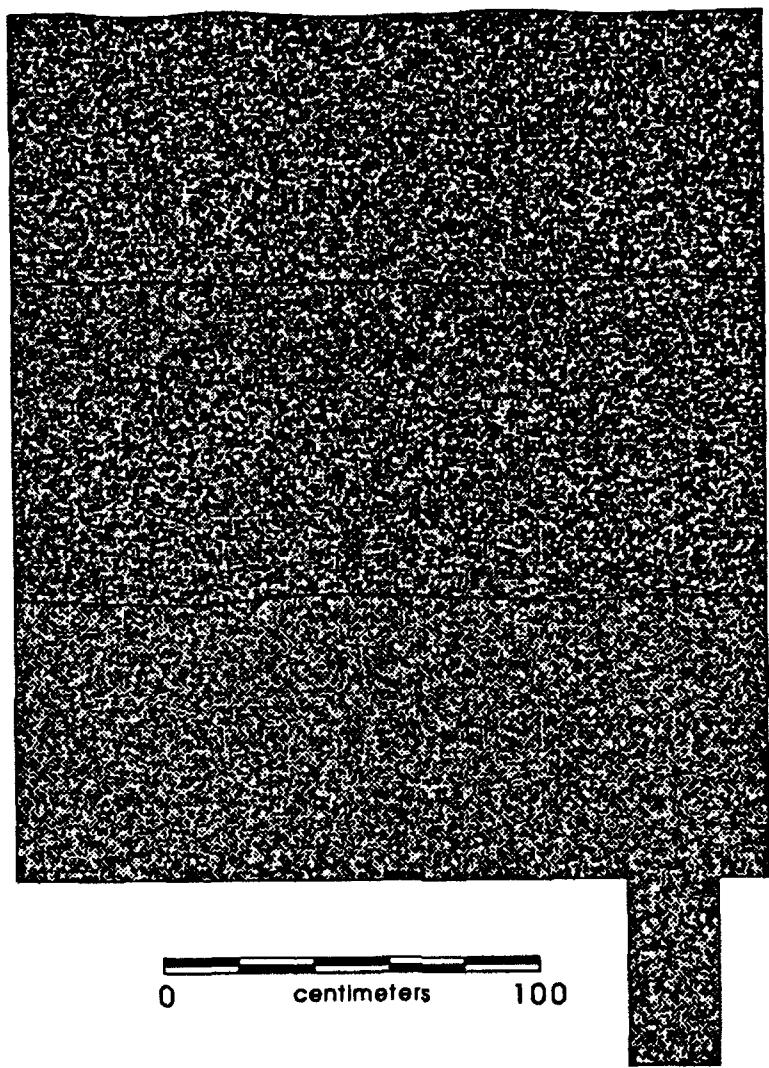


Figure 23. Profile of Test Unit 3 at 23CE442.

Cultural Affiliation - 23CE442 was occupied during the Middle or Late Woodland Period and may represent a single component site, given the absence of other cultural diagnostics. The ceramics recovered are plain, well-fired and tempered with extremely fine grit that does not react to hydrochloric acid. These materials offer little guidance regarding possible phase assignments, but may date to the Middle, rather than Late, Woodland since ceramics from the latter are often limestone-tempered.

Site Function - Activities suggested by the artifacts recovered include food preparation and storage, refuse disposal, stone tool manufacture and maintenance, and possibly plant food processing. Evidence of long-term habitation, such as structure remains, storage facilities, or midden accumulation, was not recovered but the presence of pottery suggests the possibility of longer term habitation and we have tentatively classified the site as a base settlement.

Site Integrity - 23CE442 does not appear to have suffered damage from clearing, cultivating or surface erosion as have many other sites in the area. River migration appears to be less serious as well but we can only estimate for the period following the production of the 1:4,800 scale maps. How much of the site has actually been lost to erosion is not precisely known, but our mapping shows little river bank erosion near 23CE443 and over most of 23CE442. The exception to this is at the far west end of 23CE442 where about 20 m of the river bank has been lost. Our excavations also discovered evidence of undisturbed deposits in Test Unit 1 where potsherds occurred in well-defined clusters rather than being randomly strewn throughout the matrix.

Significance Assessment - 23CE442 contains data that make it eligible for inclusion in the National Register of Historic Places under criterion D. It is an apparent single component Woodland Period site that exhibits good integrity and is one of only a few pottery-bearing sites on the Sac River. In the Stockton Lake vicinity, bottomland sites normally yield sparse ceramics, if any at all. At 23CE442 sherds comprise the majority of recovered artifacts. Test Unit 1 yielded more ceramics than all other sites tested to date downstream from the Stockton Dam and clearly indicates that, from a functional standpoint, 23CE442 is different from other floodplain sites tested thus far. The site affords the opportunity to study Woodland Period activities in the Sac River Valley and to flesh out the regional culture history. Additional work in the form of bank stabilization or data recovery is recommended.

23CE444

23CE444 is situated on a low north-south trending ridge that appears to be a natural levee formed by a former channel of the Sac River (Figure 24). A moderately dense scatter of lithics is visible on the surface and extends slightly more than 100 m north of Tract 2501E-1 to State Road N. An abandoned channel of the Sac River is situated in a wooded area immediately west of the cultivated field in which the site is located. An east-west trending drainage ditch crosses the south end of the site about 200 m south of State Road N. South of this ditch, only a few scattered artifacts occur.

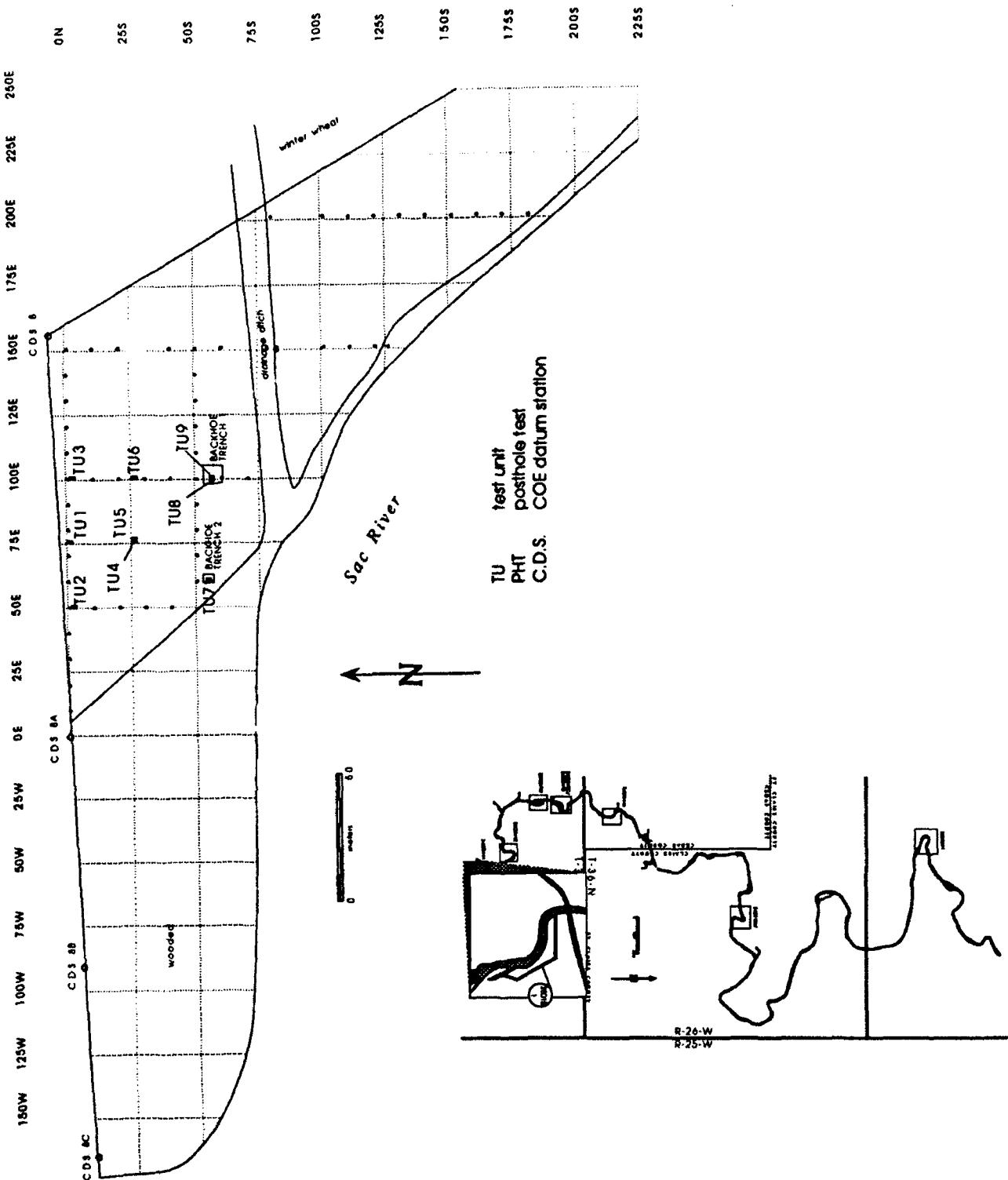


Figure 24. HPA investigations at 23CE444.

Our work at 23CE444 took place between 20 February and 4 April 1991. The boundaries of the easement were first resurveyed to confirm that we were in the correct location and to establish the limits of our work area. By using the original survey notes and topographic maps provided by the Kansas City District, we relocated COE survey markers 8, 8A, 8B and 8C. The latter 3 were clearly marked on the ground and easily relocated while marker 8, which was buried in the agricultural field, was replotted but not exposed. Subsequent investigations included piece plotting of surface artifacts and the excavation of 39 shovel tests, 14 posthole tests and 9 1 m x 2 m test units. As a result, 1,078 items (Table 13), both cultural and non-cultural, were recovered as well as information on the nature and extent of the cultural deposits.

Table 13. Artifacts recovered from 23CE444.

Artifact Description	Ct	Wt (g)			
Arrow point	1	0.4	Flake, primary decort	2	3.2
Arrow point (Scallorn?)	2	0.8	Flake, retouch	79	16.5
Biface fragment	2	14.4	Flake, secondary decort	3	3.0
Black walnut shell frag	1	0.4	Floral remains, unident		0.2
Bone, unidentified	2	0.3	Glass, clear bottle	1	0.9
Burned clay	9	2.6	Ground stone, misc.	1	204.6
Charcoal, unidentified	87	21.6	Hematite		15.8
Chippable stone, unmod	3	689.2	Metal, unidentified	1	2.0
Cobble, tested	7	2318.2	Quartz	1	99.5
Core	7	1153.1	Sandstone	582	8167.6
Dart point (Dalton)	1	13.9	Seeds, unidentified	29	0.3
Dart point midsection	1	10.4	Shatter	94	672.6
Flake, broken	23	9.5	Unidentified material	54	0.2
Flake, interior	86	142.0	Total	1078	13563.2

Artifacts visible on the surface were flagged and piece plotted using a transit (Figures 25 and 26). Three hundred eighteen artifacts were plotted, 297 of which occurred north of the drainage ditch. Twenty-four surface artifacts were collected for further analysis and the remainder left in place. Eight posthole tests and 19 shovel tests yielded cultural materials and generally confirmed the distribution of artifacts found on the surface. A Dalton point (Cat. No. 1-1) was found in the river below 23CE444 (Figure 27). This point is manufactured from a discolored Burlington chert, weighs 13.9 g and measures 8.02 cm x 2.4 cm x .76 cm. The point is thin, has serrated edges, has been edge-ground and unifacially reshaped at least twice and evidences significant use-polish on the edges. This Dalton point was used in cutting and butchering activities. A Scallorn-like arrow point (Cat. No. 9-1) was found at 9.92S/67.61E (Surface Plot 77). This corner-notched point was manufactured from heat-treated Burlington chert Variety 3, weighs .5 g and measures 1.61 cm x 1.0 cm x .28 cm. Scallorn points are most often associated with the Late Woodland Period dating from AD 500 - AD 900. A heat-treated biface (Cat. No. 19-1) was found at 27.13S/63.28E (Surface Plot 225). This tool is manufactured from Keokuk chert Variety 1, weighs 8.5 g and measures 3.8 cm x 2.36 cm x .84 cm. The edges are rounded and show use-polish, probably from cutting activities. This artifact cannot be dated. A serrated uniface (Cat. No. 7-1) was found at 17.76S/83.27E (Surface Plot 44). This tool was made from Keokuk chert Variety 1, weighs 5.9 g and measures 2.51 cm x 2.18 cm x 1.0 cm. Light polish on the edges suggests use in plant fiber processing. This artifact cannot be dated.

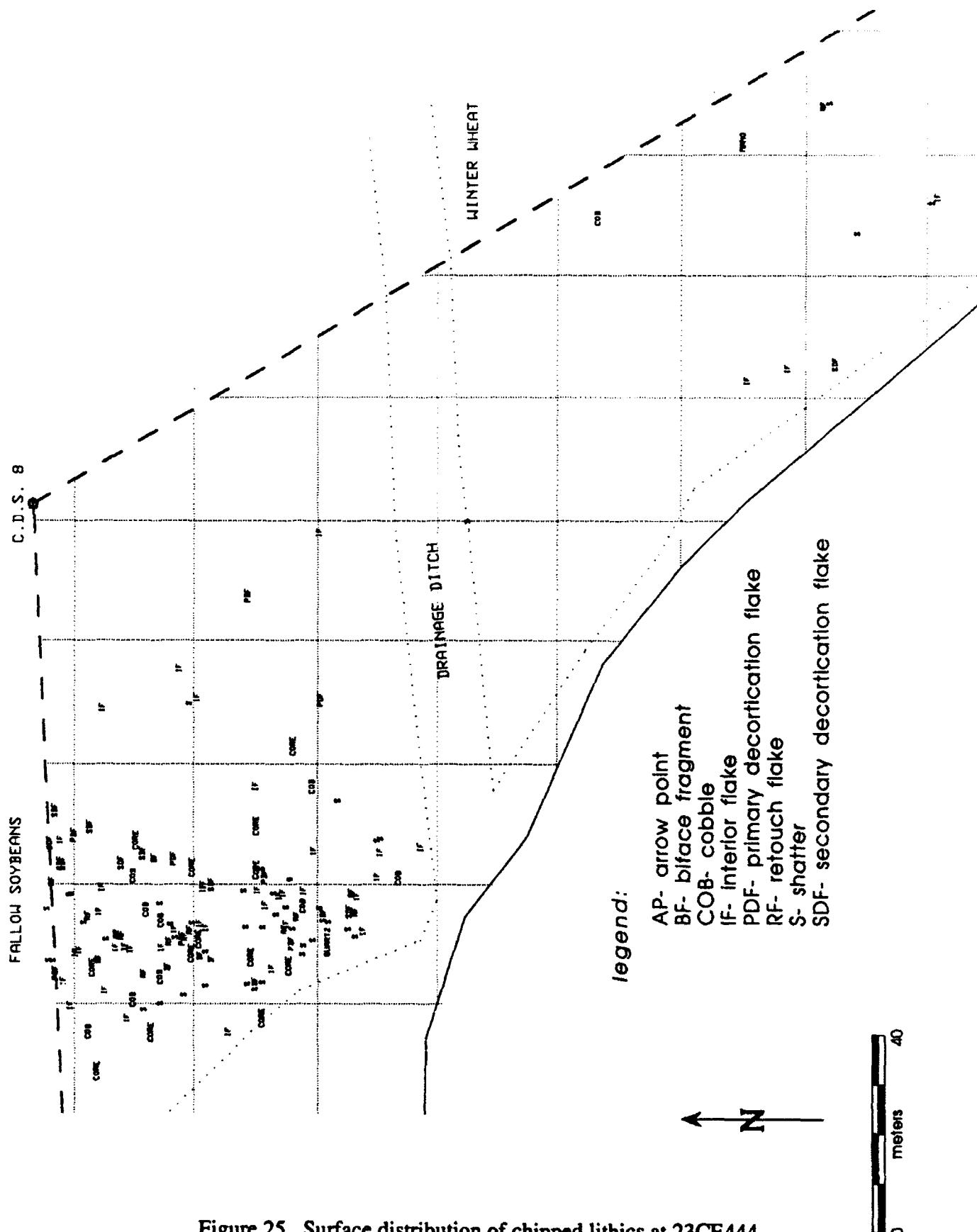


Figure 25. Surface distribution of chipped lithics at 23CE444.

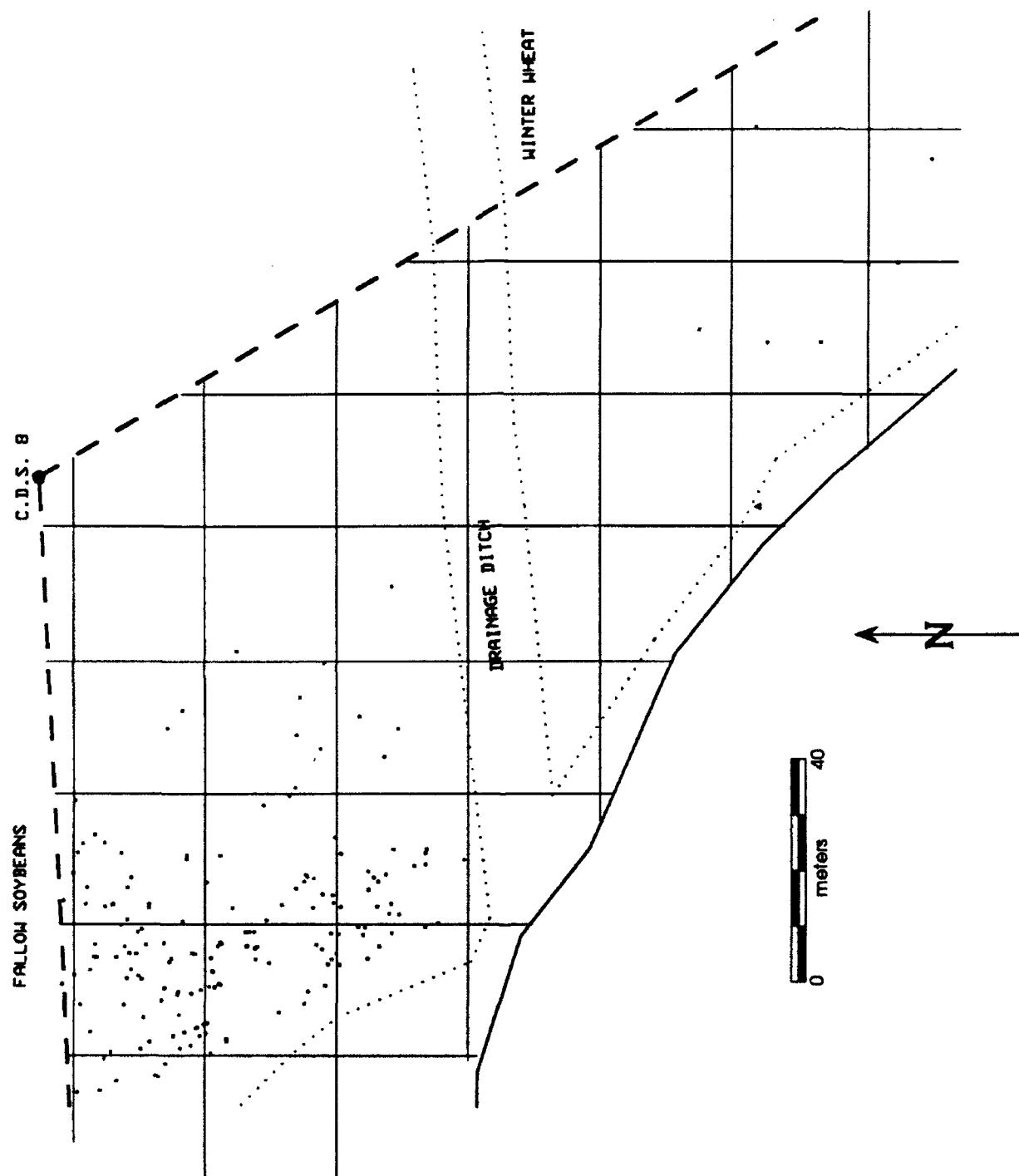


Figure 26. Surface distribution of sandstone at 23CE444.

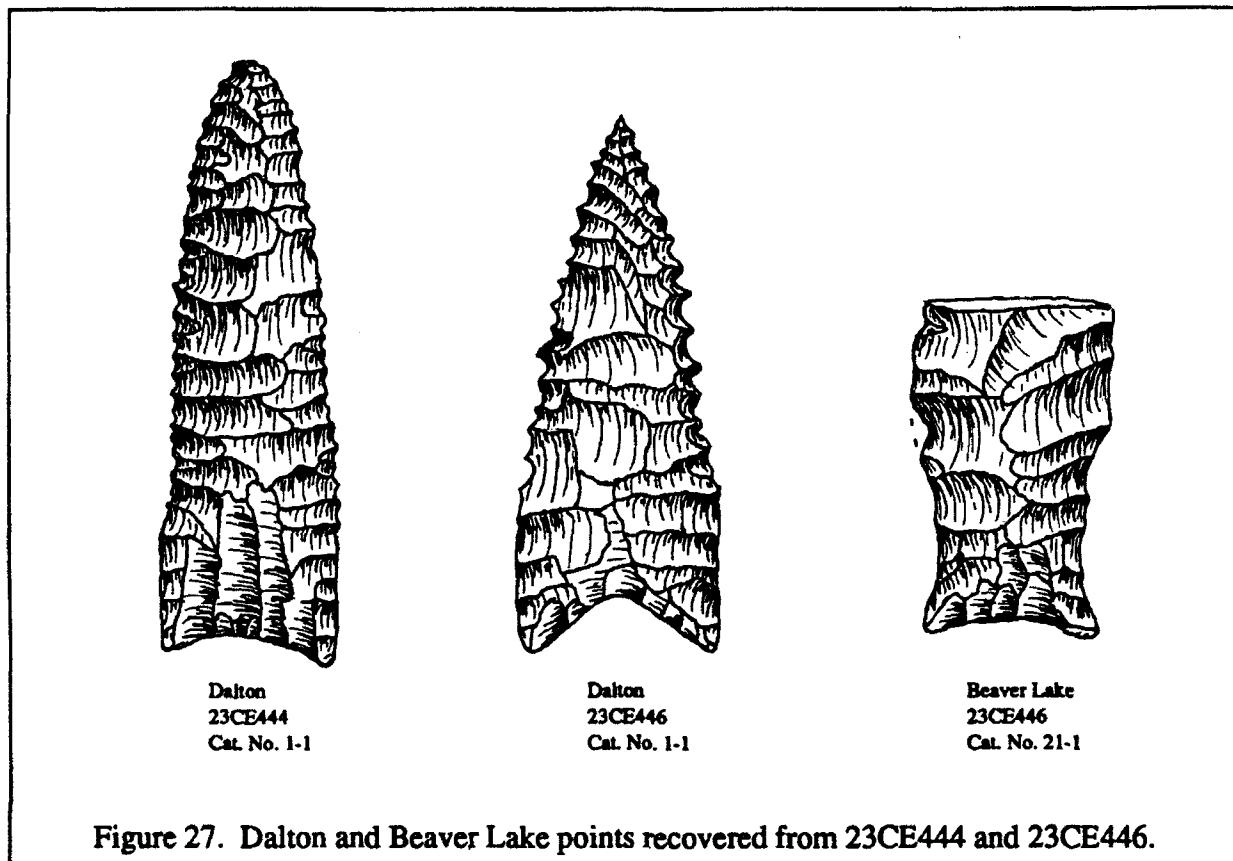


Figure 27. Dalton and Beaver Lake points recovered from 23CE444 and 23CE446.

Nine 1 m x 2 m test units were established at grid coordinates 0N/75E, 1S/50E, 1S/100E, 25S/75E, 25S/76E, 25S/100E, 53.5S/60E, 55.2S/99E and 55S/100E. These were excavated in 10 cm levels by troweling and shovel skimming. Excavated soil was screened through $\frac{1}{4}$ inch mesh hardware cloth and the cultural materials recovered placed in paper nail bags labeled with the site number, test unit number, level number, date and the initials of the excavator and screener. Excavation proceeded until a culturally sterile level was encountered, at which point a posthole test or 50 cm x 50 cm shovel test was excavated in 10 cm levels an additional 50 cm to confirm that the base of the deposits had been reached. Upon completion, one wall was drawn in profile and photographed in black and white and color slides.

Test Unit 1 was placed at 0S/75E and excavated in 10 cm levels to a depth of 70 cm where a 50 cm x 50 cm shovel test was excavated an additional 50 cm to 120 cm. One hundred sixteen artifacts were recovered from levels 1 through 6 (0 cm - 60 cm) and included 1 arrow point, 1 tested cobble, 1 broken flake, 26 interior flakes, 1 primary decortication flake, 12 retouch flakes, 65 pieces of sandstone and 9 pieces of chert shatter. Eighty (69%) of these items were recovered from levels 1 and 2, including a Scallorn-like arrow point (Cat. No. 66-5). This corner-notched point is manufactured from Jefferson/Cotter undifferentiated chert, weighs .3 g and measures 1.34 cm x .88 cm x .27 cm. It was fractured on impact. Scallorn-like points date to the Late Woodland Period (AD 500 - AD 900). A lone flake was recovered from level 12 (110 cm - 120 cm) in the shovel test but was coated with dried soil very different from that found in the level and had probably been either tracked into the unit or had fallen in from a higher level. Otherwise,

only 6 artifacts were recovered below 40 cm. Three strata were revealed in Test Unit 1 (Figure 28; Photographs 4 and 5). Stratum 1 was a dark brown (10YR3/3) silt loam that extended to 30 cm to 40 cm. Stratum 2 was a dark grayish brown (10YR4/2) silty clay that extended to 86 cm. Stratum 3 was a dark brown (10YR3/3) silty clay that extended to the base of the shovel test.

Test Unit 2 was placed at 1S/50E and excavated in 10 cm levels to a depth of 150 cm where a 50 cm x 50 cm shovel test was excavated an additional 50 cm to 200 cm. One hundred fifty-seven artifacts were recovered from Levels 1 through 10 (0 cm - 100 cm) and Level 14 (130 cm - 140 cm), including 20 pieces of charcoal, 1 broken flake, 17 interior flakes, 1 primary decortication flake, 14 retouch flakes, 1 fragment of an unidentified ground stone tool, 88 pieces of sandstone and 15 pieces of chert shatter. Eighty (51%) of these items were recovered from levels 1 and 2, with a secondary peak (21 items) occurring in Level 6 (60 cm - 70 cm). The entire unit was excavated to 80 cm where it was stepped down to 1 m x 1 m due to extreme difficulty encountered in screening the soil. When level 10 failed to yield any cultural items, a 50 cm x 50 cm shovel test was begun in the northwest corner of the unit. However, a fragment of a ground stone tool was recovered from Level 14 and the unit was continued to a depth of 150 cm where culturally sterile soil was encountered. Three strata were revealed in Test Unit 2 (Figure 29). Stratum 1 was a dark grayish brown (10YR4/2) silt loam that extended to 35 cm. Stratum 2 was a brown to dark brown (10YR4/3) silt loam that extended to about 108 cm. Stratum 3 was a dark brown (10YR3/3) silt loam that extended to the base of the excavation.

Test Unit 3 was placed at 1S/100E and excavated in 10 cm levels to a depth of 40 cm where a 50 cm x 50 cm shovel test was excavated an additional 50 cm to 90 cm. Twelve items were recovered from levels 1 through 3 (0 cm - 30 cm), including 1 broken flake, 1 retouch flake, 1 secondary decortication flake, 1 sherd of clear bottle glass, 1 piece of metal and 7 pieces of sandstone. Two strata were revealed in the excavation of Test Unit 3 (Figure 30). Stratum 1 was a dark brown (10YR3/3) silt loam that extended to 22 cm - 29 cm. Stratum 2 was a very dark grayish brown (10YR3/2) silt loam that extended to the base of the excavation and exhibited dark yellowish brown (10YR4/6) and light brownish gray (10YR6/2) mottling below 64 cm.

Test Unit 4 was placed at 25S/75E and excavated in 10 cm levels to 60 cm where 3 circular stains, thought to be post molds, were found. Excavation ceased at that point and Test Unit 5 was opened on the east side of Test Unit 4 and excavated similarly to 60 cm. Excavation then continued in both units to a depth of 90 cm where a 1 m x 1 m level was excavated in the north half of Test Unit 4 to a depth of 100 cm to expose Features 1 and 2 in profile. Features 1, 2 and 3 were then cross sectioned, drawn, photographed and removed. A 50 cm x 50 cm shovel test was then excavated an additional 40 cm in the northeast corner of Test Unit 4 to 140 cm. One hundred eighty-three items were recovered from Test Unit 4, including 1 walnut shell fragment, 4 pieces of charcoal, 2 broken flakes, 15 interior flakes, 11 retouch flakes, 2 secondary decortication flakes, 126 pieces of sandstone and 22 pieces of chert shatter. One hundred twenty-six (69%) of these items were recovered from levels 1 - 3 (0 cm - 30 cm) with a secondary peak (23 items) in level 6 (50 cm - 60 cm). One hundred forty-one items were recovered from Test Unit 5, including 1 arrow point, 1 piece of unidentified bone, 2 pieces of charcoal, 3 broken flakes, 7 interior flakes, 12 retouch flakes, 104 pieces of sandstone and 11 pieces of shatter. One hundred eleven (79%)

TEST UNIT 1 WEST WALL PROFILE

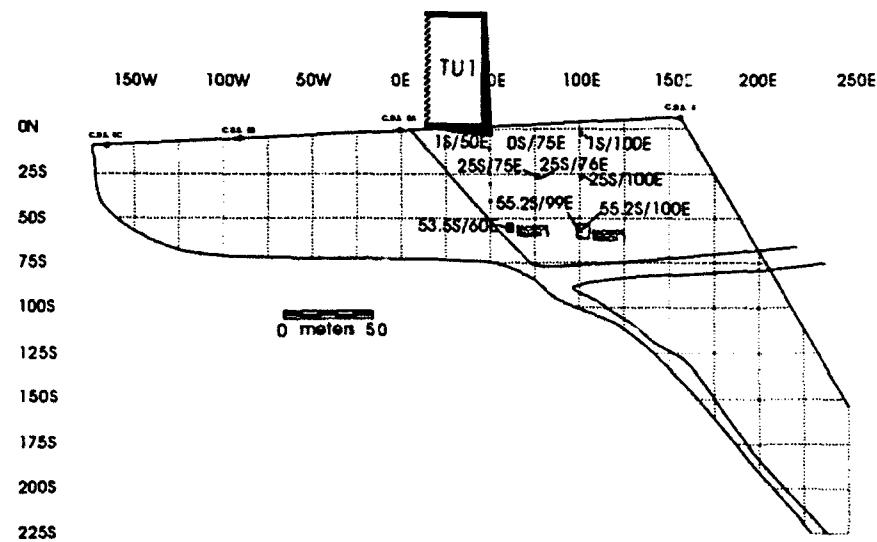
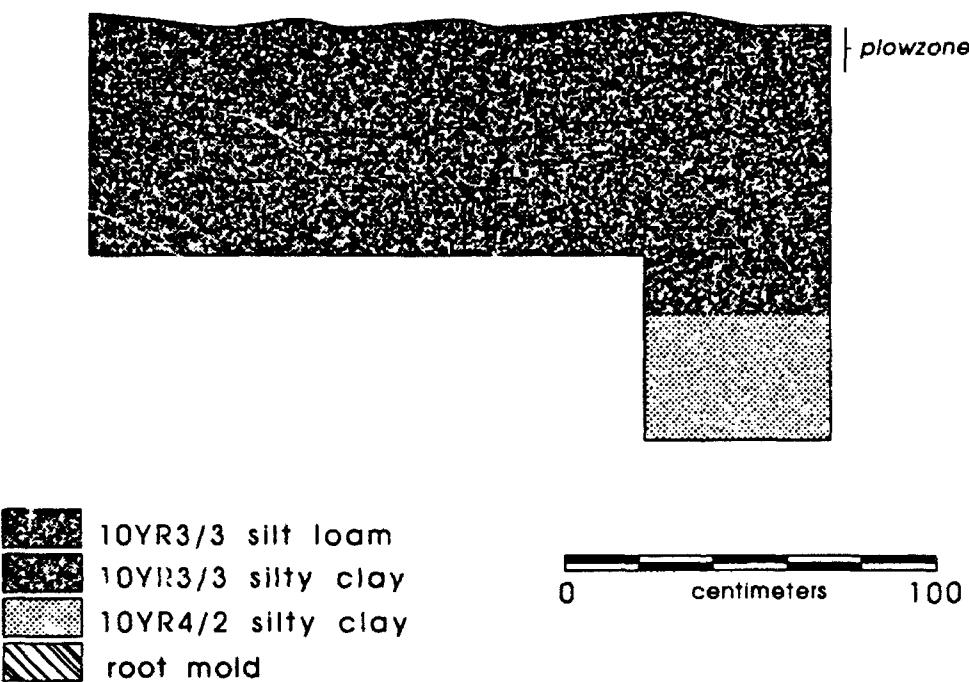
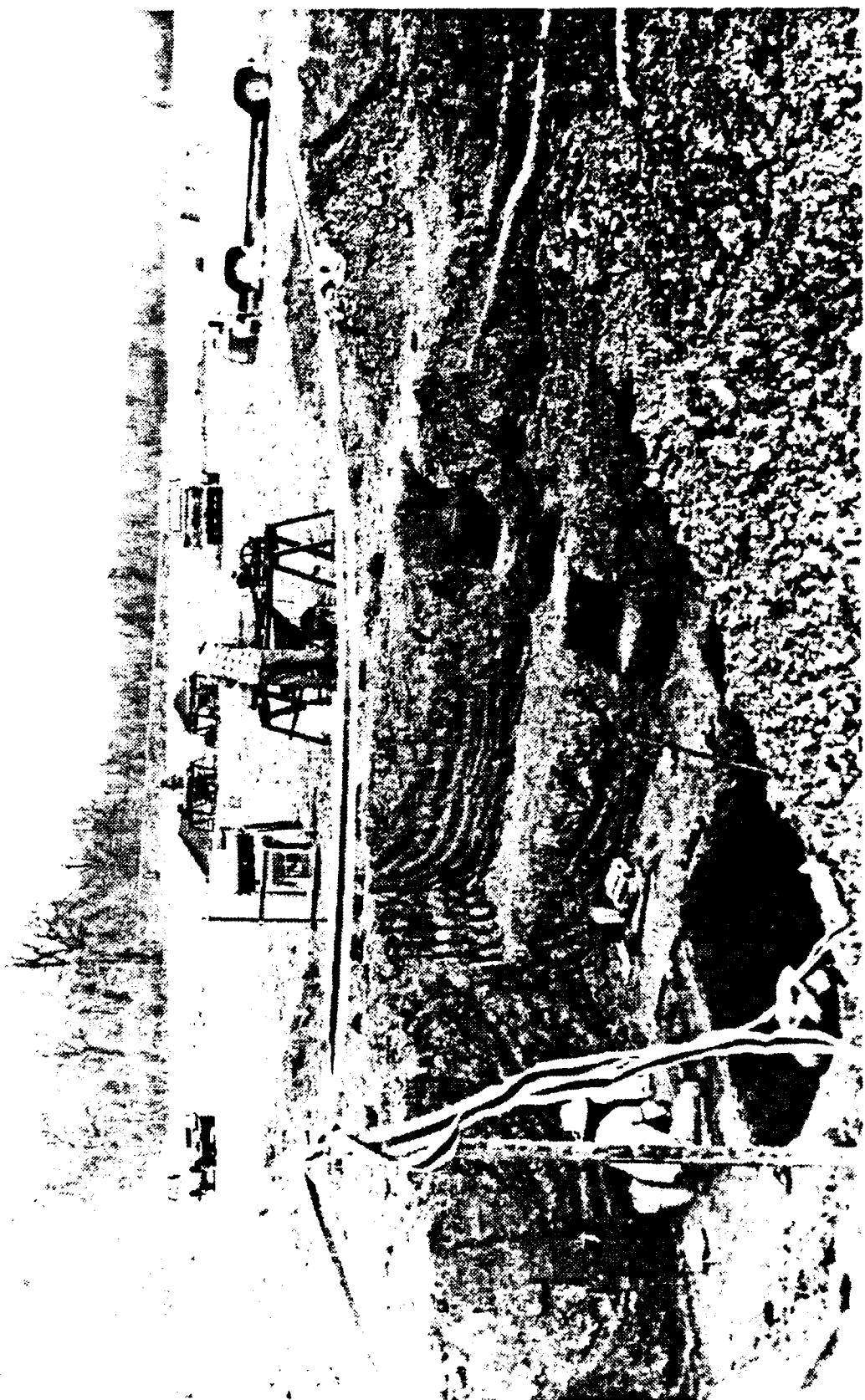


Figure 28. Profile of Test Unit 1 at 23CE444.



Photograph 4. Excavation of Test Unit 1 in Trench 1 at 23CE444.



Photograph 5. Profile review of Test Unit 1 in Trench 1 at 23CE444.

TEST UNIT 2 WEST WALL PROFILE

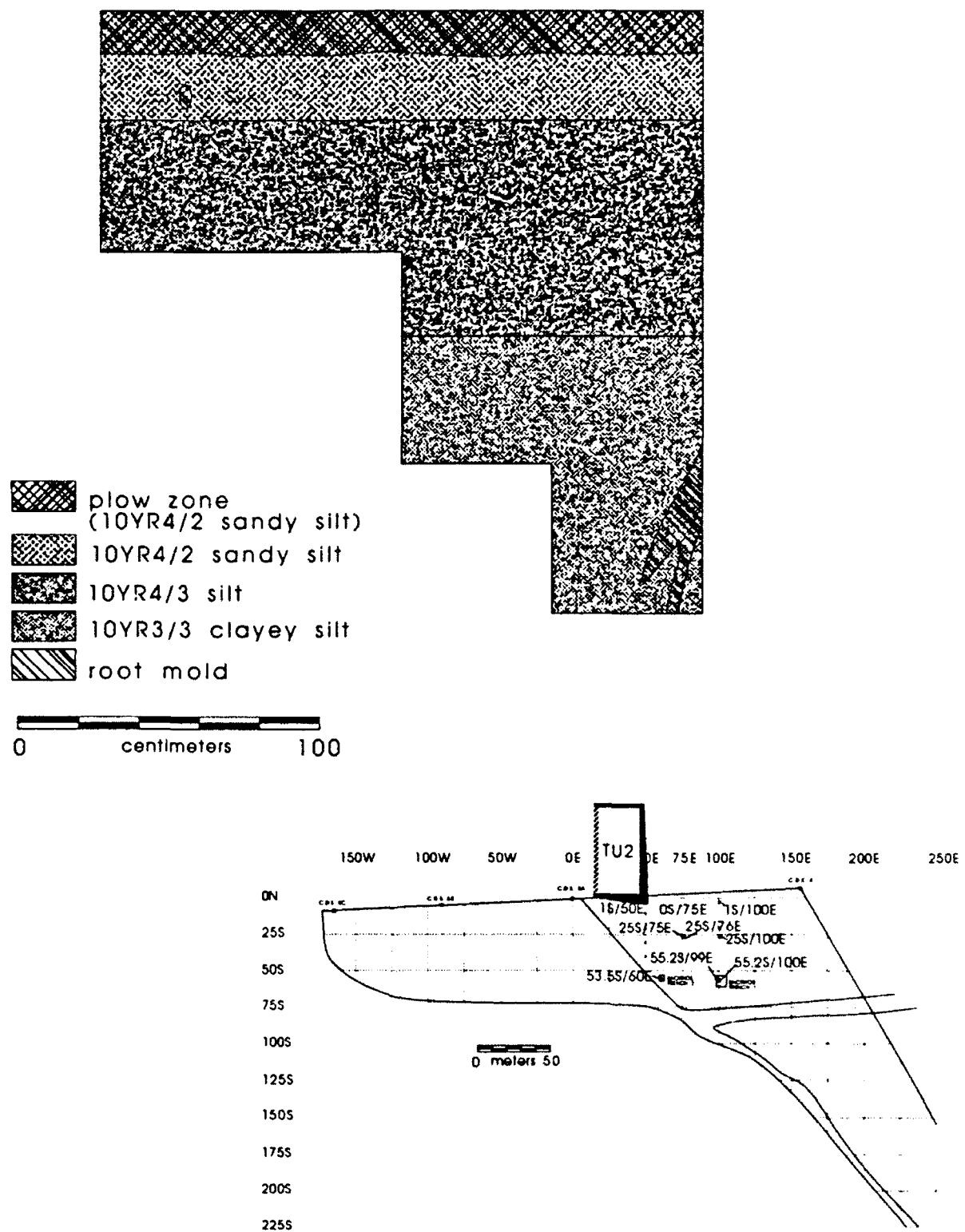


Figure 29. Profile of Test Unit 2 at 23CE444.

TEST UNIT 3 WEST WALL PROFILE

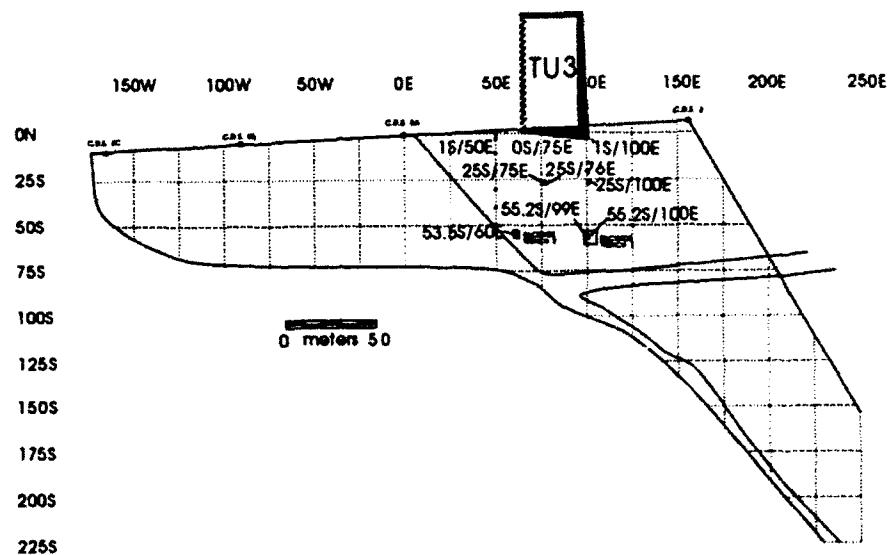
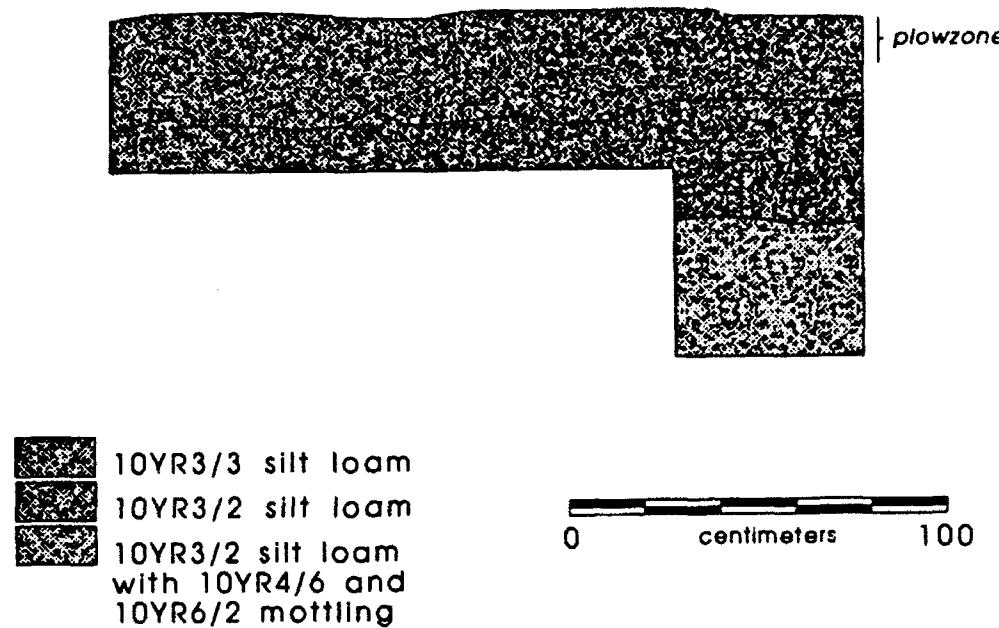


Figure 30. Profile of Test Unit 3 at 23CE444.

of these were recovered from levels 1 - 3 (0 cm - 30 cm). A very crude but small arrow point (Cat. No. 99-3) was found in Level 3 (20 cm - 30 cm). This point is manufactured from a flake of heat-treated Burlington chert Variety 2, weighs .4 g and measures 2.1 cm x .9 cm x .2 cm. It has a parallel stem with a convex base and sloping shoulders. Although this point does not resemble an established type, it is similar to the Scallorn and probably dates to the Late Woodland Period.

Three features were encountered during the excavation of Test Units 4 and 5 (Figures 31 and 32; Photograph 6). Feature 1 was a small, circular stain that was conical in profile. It was first encountered at a depth of 53 cm and reached a depth of 80 cm. Flotation and finescreen processing of the matrix yielded 1 retouch flake, 3 pieces of shatter, 4 pieces of sandstone, 5 pieces of charcoal, a small amount of uncarbonized vegetal material composed mostly of rootlets and leaf fragments, 10 seeds and 1 fragment of bone. A chemical analysis of the matrix yielded a pH of 6.2 and a phosphate level of less than 1.5 ppm. Feature 2 was virtually identical in configuration, although it was slightly larger. It was first identified at 60 cm and reached a depth of 94 cm. Flotation and finescreen processing yielded 1 retouch flake, 15.6 g of charcoal, 7 seeds and 54 items that appear to be small concretions. A chemical analysis yielded a pH of 6.3 and a phosphate level of less than 1.5 ppm. Feature 3 was an irregular, shallow stain first encountered at 47 cm and reaching a depth of 52 cm. Flotation and finescreen processing yielded 1 retouch flake, 9 pieces of charcoal, 0.1 g of uncarbonized floral material composed of rootlets and leaf fragments, 12 seeds and 1 piece of burned clay. A chemical analysis yielded a pH of 6.0 and a phosphate level of less than 1.5 ppm. When features 1 and 2, as well as a third stain that turned out to be a root mold, were first encountered, it was thought that they might represent the remains of a structure similar to those identified at Dryocopus Village and Flycatcher. It was hoped that additional features would be found in Test Unit 5. Unfortunately, no cultural features were found in Test Unit 5. Feature 3 appears to be a natural disturbance. It was irregular in configuration and barely distinguishable from the surrounding matrix. While the material content of features is, generally, not a good indicator of function, the similar content of all 3 features and the low phosphate content argue in favor of natural disturbances. Features 1 and 2 are more likely the remains of burned tap roots than prehistoric post molds, although we would not absolutely rule out the latter.

Three strata were encountered in Test Units 4 and 5 (Figure 33). Stratum 1 was a dark yellowish brown (10YR3/4) loam that extended to about 40 cm. Stratum 2 was a brown to dark brown (10YR4/3) silty clay that extended to 120 cm. Stratum 3 was a dark brown (10YR3/3) silt loam that extended to the base of the excavation.

Test Unit 6 was placed at 25S/100E and excavated in 10 cm levels to 30 cm where a 50 cm x 50 cm shovel test was excavated an additional 50 cm to 80 cm. Eighteen cultural and non-cultural items were recovered from levels 1 through 3 (0 cm - 30 cm), 16 of which were recovered from Level 2. These included 3 broken flakes, 3 retouch flakes, 7 pieces of unmodified sandstone and 5 pieces of chert shatter. Six pieces of unmodified sandstone were also recovered from level 6. Four strata were identified during the excavation of Test Unit 6 (Figure 34). Stratum 1 was a dark brown (10YR3/3) silt loam that extended to a depth of 26 cm - 28 cm. Stratum 2 was a very dark grayish brown (10YR3/2) silt loam that extended to 39 cm. Stratum 3 was a dark brown (10YR3/3) silt loam with gray mottling that extended to 60 cm. Stratum 4 was a very dark grayish brown (10YR3/2) silt loam that extended to the base of the excavation.

TEST UNIT 4/5 PLANVIEW

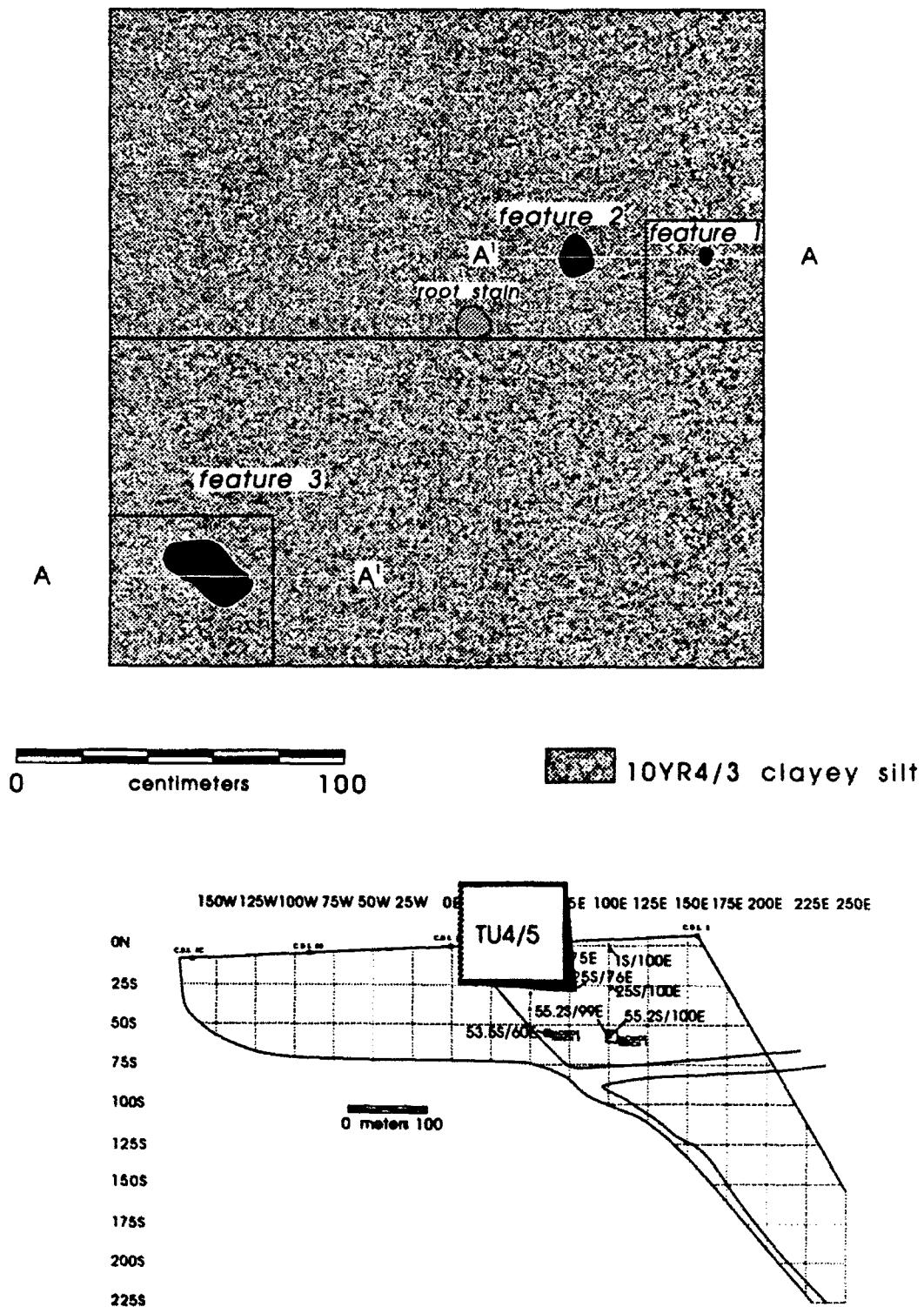


Figure 31. Planviews of features found in Test Units 4 and 5 at 23CE444.

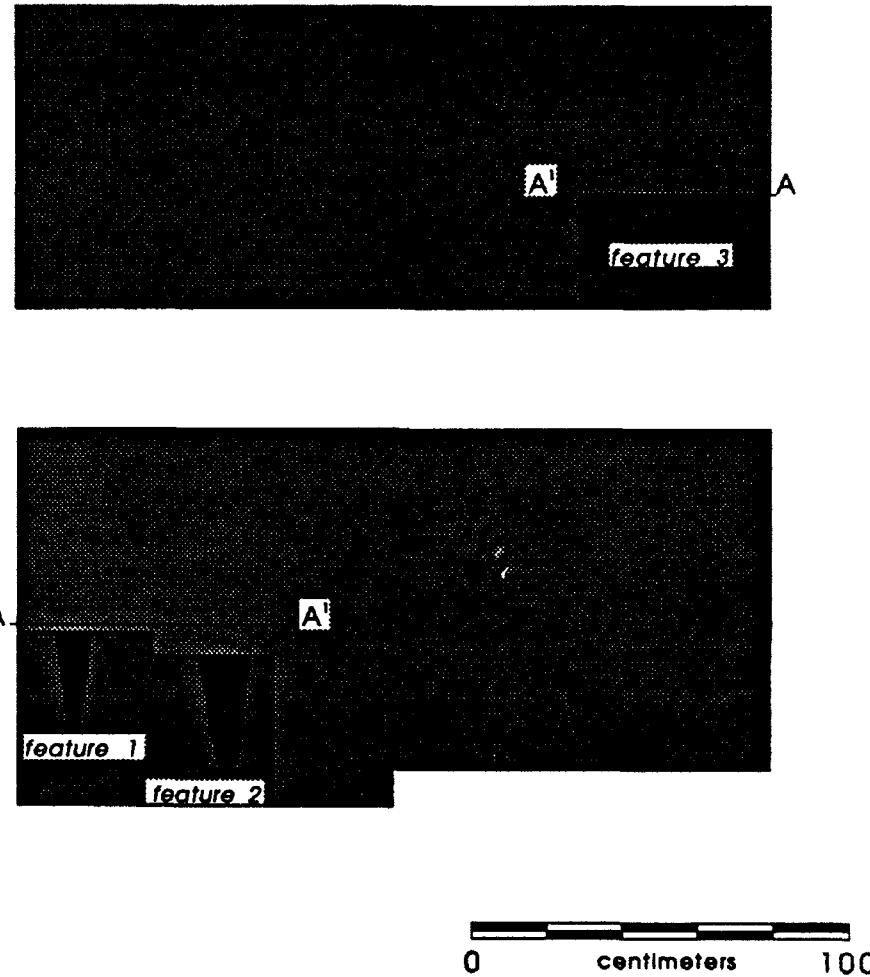


Figure 32. Profiles of features found in Test Units 4 and 5 at 23CE444.

TEST UNIT 4/5 WEST WALL PROFILE

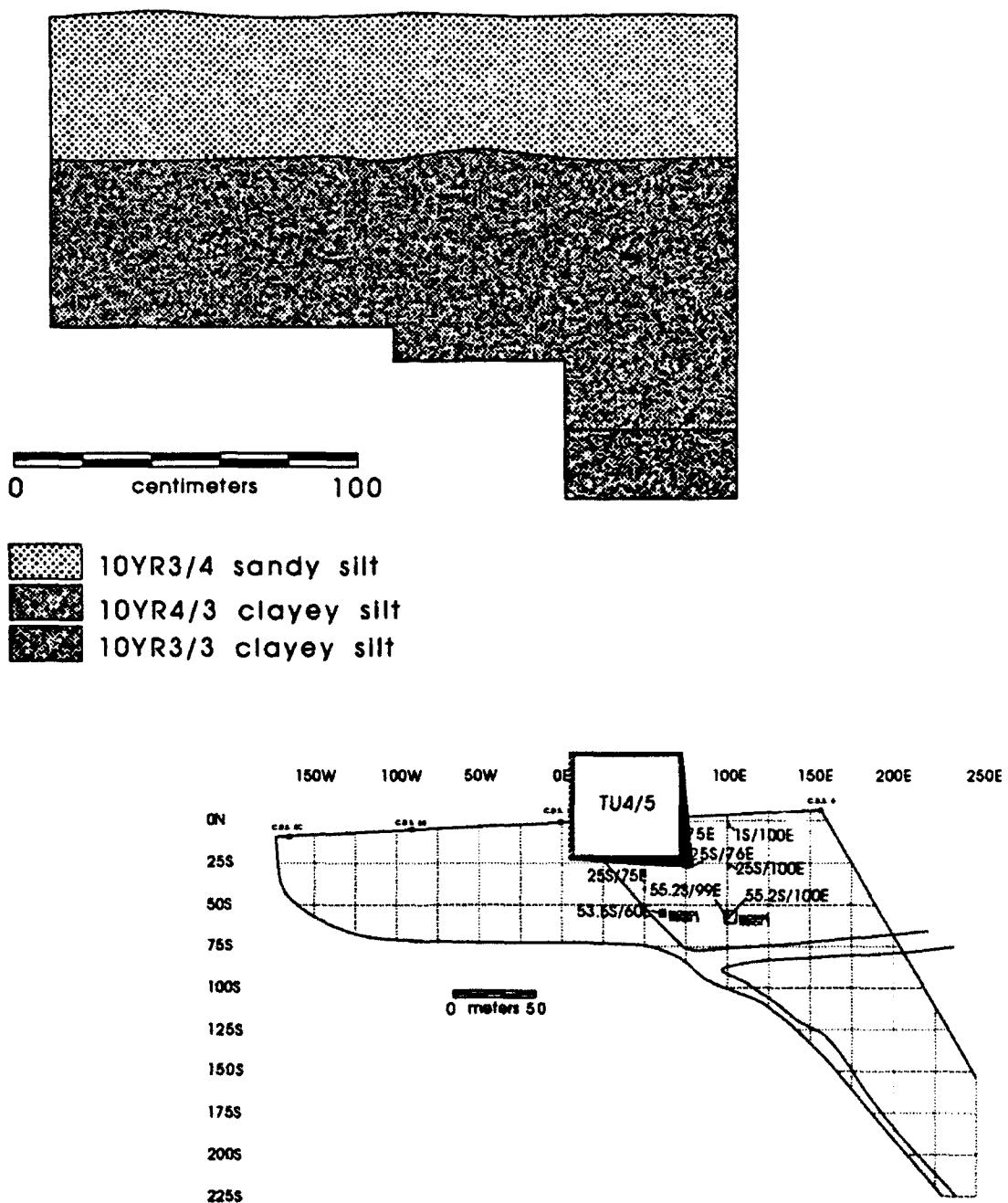


Figure 33. Profile of Test Units 4 and 5 at 23CE444.



Photograph 6. Completed excavation of Test Units 4 and 5 at 23CE444.

TEST UNIT 6 WEST WALL PROFILE

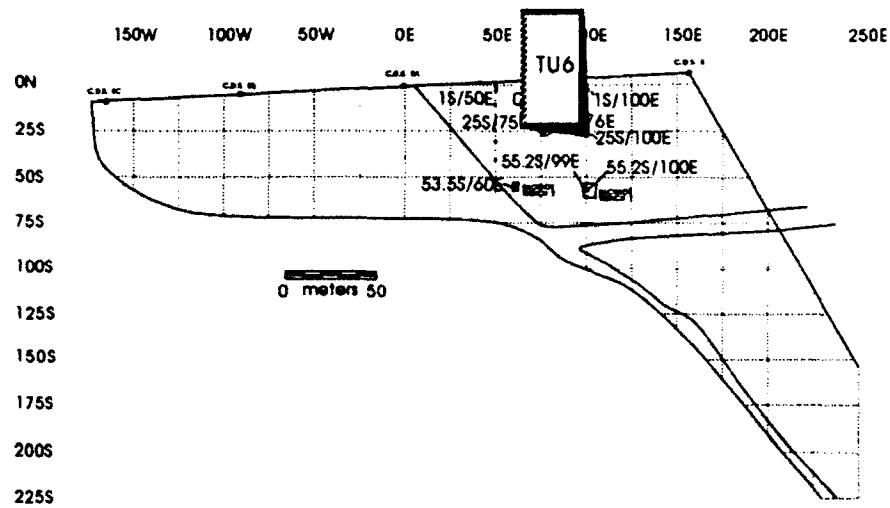
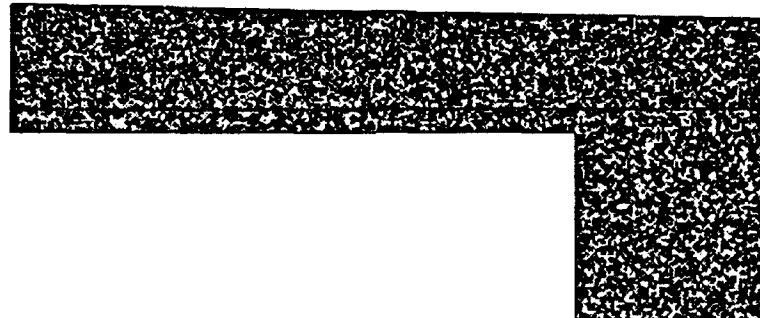


Figure 34. Profile of Test Unit 6 at 23CE444.

Test Unit 7 was placed at 53.5S/60E in the bottom of a 140 cm deep backhoe trench and excavated in 10 cm levels to 210 cm where a 50 cm x 50 cm shovel test was excavated an additional 50 cm to 260 cm. Sixty-four cultural and non-cultural items were recovered from levels 15 through 20 (140 cm - 200 cm). These included 8 pieces of burned clay, 44 pieces of charcoal, 2 broken flakes, 1 interior flake, 1 retouch flake, 6 pieces of unmodified sandstone and 2 pieces of chert shatter. Three strata were identified during excavation (Figure 35). Stratum 1 was a dark brown (10YR3/3) silt loam that extended to 70 cm to 80 cm below surface. Stratum 2 was a very dark grayish brown (10YR3/2) silt loam that extended as deep as 190 cm but, at the north end of the excavation, reached only to 156 cm. Stratum 3 was a dark brown (10YR3/3) sandy silt that extended to the base of the excavation.

Test Unit 8 was placed at 55.2S/99E in Backhoe Trench 1 at a starting depth of 180 cm and excavated in 10 cm levels to 250 cm where a posthole test was excavated an additional 50 cm to 300 cm. Thirty-one cultural and non-cultural items were recovered from levels 19 through 24 (180 cm - 240 cm), 18 of which came from levels 21 and 22. These included 2 pieces of charcoal, 1 tested cobble, 1 stemmed dart point fragment, 4 broken flakes, 6 interior flakes, some possible hematite, 9 pieces of unmodified sandstone and 8 pieces of chert shatter. The dart point fragment (Cat. No. 119-4) was found in the 210 cm - 220 cm level. This tool is manufactured from heat-treated Burlington chert, weighs 10.4 cm and measures 3.91 cm x 3.15 cm x .82 cm. The blade has snapped and shows edge-rounding and use-polish. The base has also been broken off. The shoulders are sloping and do not appear to have been barbed. Cutting and butchering activities are indicated by a close analysis of this tool. It is too badly damaged to assign to a known type.

Test Unit 9 was placed at 55S/100E and excavated in 10 cm levels to a depth of 100 cm where a 50 cm x 50 cm shovel test was excavated an additional 50 cm to 150 cm. One hundred forty-two cultural and non-cultural items were recovered from Levels 1 through 9 (0 cm - 90 cm). About 75% of these items were recovered below 50 cm. Materials included 1 piece of charcoal, 1 tested cobble, 2 broken flakes, 5 interior flakes, 8 retouch flakes 120 pieces of unmodified sandstone and 5 pieces of chert shatter. Subsequently a backhoe trench was excavated around Test Unit 9. Test Units 8 and 9 were both placed in this trench; Test Unit 8 at a depth of 180 cm and Test Unit 9 at a depth of 400 cm. After being reestablished at 55.2S/100E, Test Unit 9 was excavated in 10 cm levels to 420 cm where a posthole test was excavated an additional 110 cm to 520 cm. No additional cultural materials were recovered from the deep levels of Test Unit 9.

Five strata were identified during the excavation of Test Units 8 and 9 as illustrated in Backhoe Trench 1 (Figure 36). Stratum 1 was a dark brown (10YR3/3) sandy silt that reached a depth of 46 cm. Stratum 2 was a dark brown (10YR3/3) silt that extended to 77 cm. Stratum 3 was a very dark grayish brown clayey silt that extended to 113 cm. Stratum 4 was a dark brown (7.5YR3/4) silt that extended to 390 cm. Stratum 5 was a dark yellowish brown (10YR4/4) silty clay that extended to the base of the excavation, becoming increasingly sandy with depth.

TEST UNIT 7 WEST WALL PROFILE

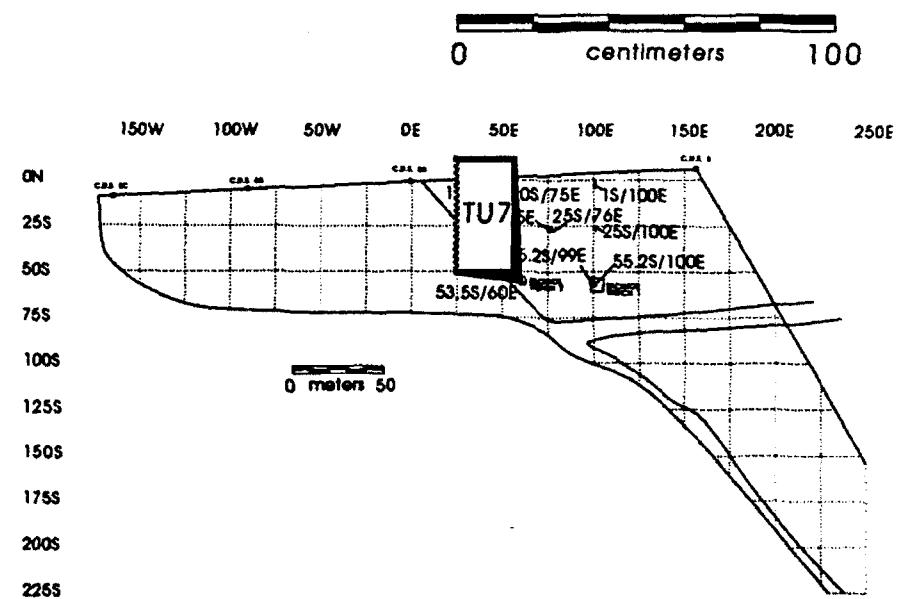


Figure 35. Profile of Test Unit 7 at 23CE444.

TEST UNIT 8/9 WEST WALL PROFILE

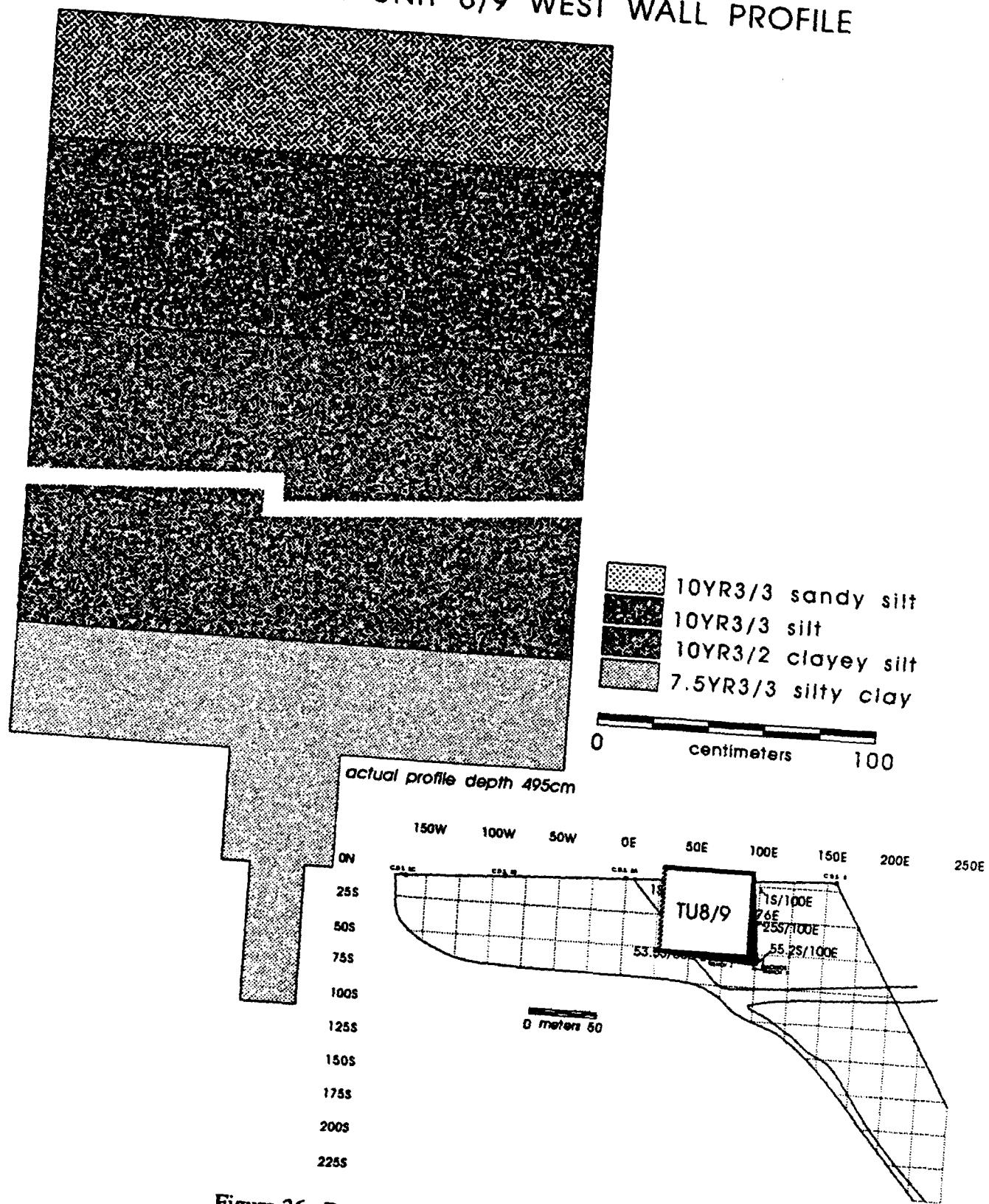


Figure 36. Profile of Backhoe Trench 1 at 23CE444.

Horizontal and Vertical Extent - Within Real Estate Tract 2501E1, cultural materials are concentrated on the north side of the drainage ditch in an area of about 2,000 m². A few sparse items occur south of the ditch but these can be accounted for by the excavation of the drainage ditch and the subsequent plow-down of the spoil pile. Deposits in the upper horizons extend to depths ranging from 60 cm to 100 cm but deeper deposits exist and reach depths as great as 240 cm.

Cultural Affiliation - 23CE444 was used at least during the Late Woodland Period (AD 400 - AD 900), as evidenced by the Scallorn points, and possibly during the Dalton Period, as shown by the Dalton point found in the river bed. We hasten to point out, however, that no evidence of a Dalton component was recovered from the excavations. The dart point fragment recovered from Level 22 of Test Unit 8, while fragmentary and not identifiable, is more recent than the Dalton Period.

Site Function - Activities suggested by the artifacts recovered include cutting/cleaving, hunting/butchering, stone tool manufacture and maintenance, plant fiber processing, possibly plant food processing and refuse disposal. These activities, together with an absence of indicators of long-term habitation such as structural remains, storage facilities and midden accumulation, suggest use as a limited activity site, possibly involving hunting activities or procurement of river resources.

Site Integrity - 23CE444 has suffered damage from clearing, cultivating and surface erosion, as have many other sites in the area. River migration does not appear to be serious. Our mapping shows little river bank erosion near 23CE444.

Significance Assessment - Our work at 23CE444 failed to produce data that would make it eligible for inclusion in the National Register of Historic Places. The features found in Test Units 4 and 5 are probably non-cultural in origin. Our assessment in connection with 23CE444 is based on the lack of significant data being present at the site. There is no evidence that structural remains or other features exist at the site. There is similarly no evidence that midden deposits or other discrete artifact concentrations are present in any strata at any depth. No datable contexts have been found at the site and none are likely to exist. There is also no indication that floral or faunal material or human remains have been preserved at the site. The combination of these characteristics have lead us to conclude that significant deposits do not occur at 23CE444. While a Dalton point was recovered, it was out of context and no evidence of a Dalton component was found. The buried component is more recent, judging by the stemmed dart point fragment recovered.

23CE446

23CE446 is situated in a cultivated field on the northeast side of an outer bend of the Sac River, approximately 500 m south of the confluence of the Sac River and Cedar Creek (Figure 37). Vegetation in the immediate vicinity consists of cultivated crops over most of the floodplain and mixed hardwoods in uncultivated areas along the river. In the immediate site area, river bank erosion has removed vegetation immediately next to the river. Almost no cultural materials are visible on the surface of the site.

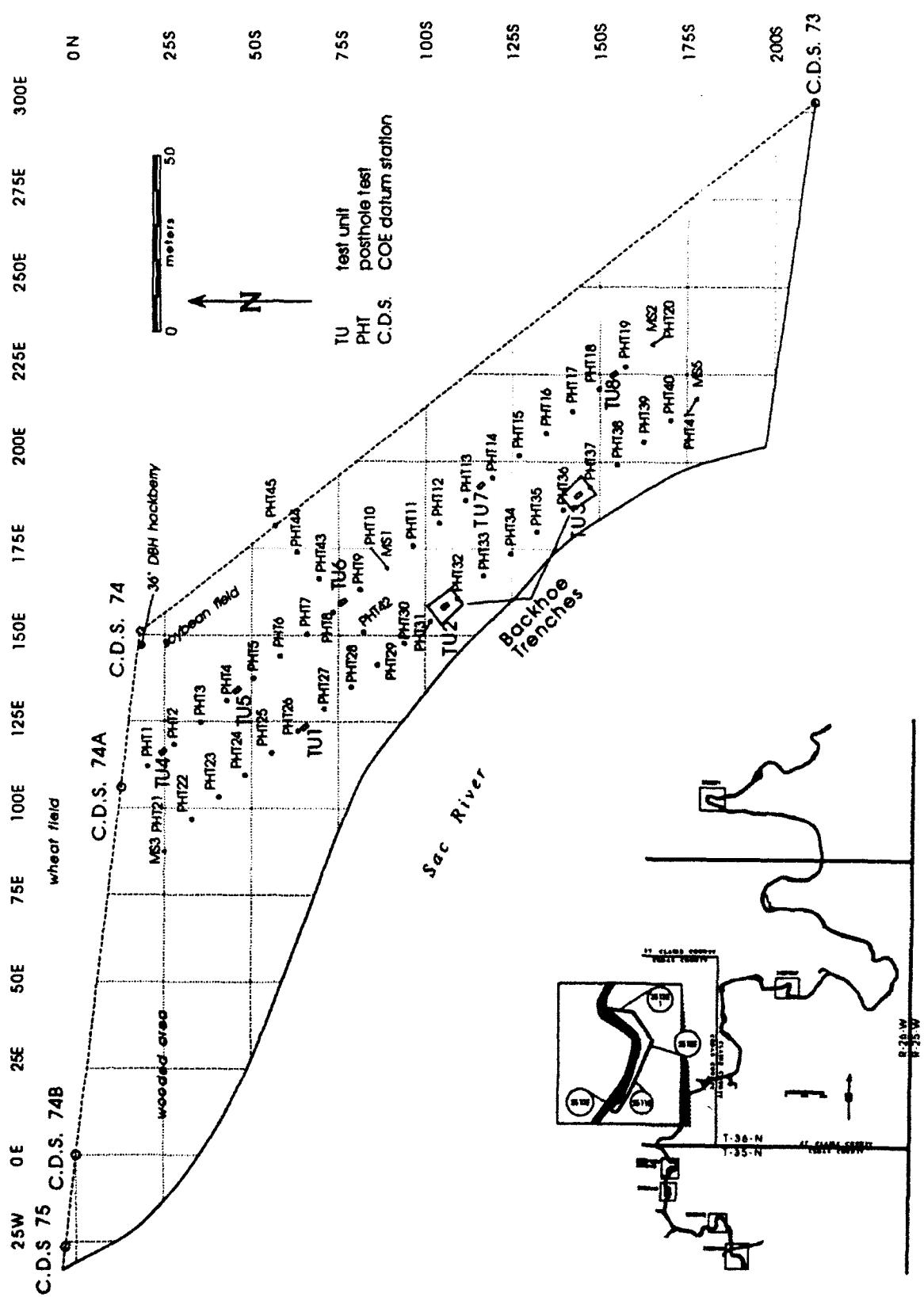


Figure 37. HPA investigations at 23CE446.

Our work at 23CE446 took place between 30 October and 30 November 1990. The boundaries of the easement were first resurveyed to confirm that we were in the correct location and to establish the limits of our work area. By using the original survey notes and topographic maps provided by the Kansas City District, we relocated COE survey markers 73, 74, 74A, 74B and 75. The latter 2 were clearly marked on the ground and easily relocated while 73, 74 and 74A, which were buried in the agricultural field, were resurveyed but not exposed. Marker 74B served as the 0/0 point on the HPA grid. Subsequent investigations included the excavation of 45 shovel/posthole tests and 8 1 m x 2 m test units. As a result, 83 items (Table 14), both cultural and non-cultural, were recovered as well as information on the nature and extent of the cultural deposits.

Table 14. Artifacts recovered from 23CE446.

Artifact Description	Ct	Wt (g)			
Burned clay	1	179.9	Flake, retouch	10	3.0
Charcoal, unidentified	16	209.1	Flake, secondary decor	3	3.9
Dart point (Dalton)	1	10.4	Glass, amethyst bottle	1	1.2
Dart point stem/base (Beaver Lake?)	1	13.3	Glass, clear bottle	1	1.3
Fire-cracked chert	1	0.5	Glass, window	1	0.3
Fire-cracked rock	13	128.1	Mussel shell	1	4.8
Flake, broken	3	1.4	Preform fragment	2	86.9
Flake, interior	15	32.1	Sandstone	3	37.1
Flake, primary decor	2	5.0	Shatter	7	13.2
			Staple, fencing	1	2.1
			Total	83	733.6

Because so few artifacts were visible on the surface, defining site limits by surface collecting was deemed ineffective. Systematic shovel testing and posthole testing were employed instead of surface collecting. Eight of 45 shovel/posthole tests yielded 12 artifacts and provided little guidance on horizontal site limits and possible locations for test units. A single Dalton point (Cat. No. 1-1) was found at the base of the river bank near the edge of the water (although it shows no evidence that it has been tumbled in the stream). The point is manufactured from Variety 3 Burlington Chert, weighs 10.4 g and measures 7.2 cm x 2.7 cm x .52 cm. The point is very thin, has use-polished serrated edges and has been resharpened at least twice by pressure flaking. This tool was used in cutting, skinning and/or butchering activities. A possible preform fragment (Cat. No. 3-2) was found in the first 5 cm of Posthole Test 11. This artifact was manufactured from Jefferson City/Cotter undifferentiated chert Variety 11, weighs 47.9 g and measures 4.55 cm x 4.82 cm x 2.25 cm. The preform shows no evidence of use and cannot be dated. A broken preform (Cat. No. 2-1) was found in the general matrix excavated from Backhoe Trench 1. This item is manufactured from Jefferson City/Cotter undifferentiated chert Variety 1, weighs 39 g and measures 3.9 cm x 5.6 cm x 1.29 cm. The preform has some cortex on one side and was apparently broken during manufacture due to a change in material texture. This artifact was lightly abraded along the edges during the reducing process and cannot be dated.

Eight 1 m x 2 m test units were established along grid lines oriented at 140° magnetic at grid coordinates 63.86S/122.83E, 105.99S/158.18E, 144.29S/190.32E, 24.19S/115.65E, 45.64S/133.65E, 76.28S/159.36E, 116.11S/192.79E and 154.41S/224.93E. These were excavated in 10 cm levels by troweling and shovel skimming. Excavated soil was screened through ¼ inch

mesh hardware cloth and the cultural materials recovered placed in paper nail bags labeled with the site number, test unit number, level number, date and the initials of the excavator and screener. Excavation proceeded until a culturally sterile level was encountered, at which point a posthole test was excavated in 10 cm levels an additional 50 cm to confirm that the base of the deposits had been reached. Upon completion, one wall was drawn in profile and photographed in black and white and color slides.

Test Unit 1 was placed at 63.86S/12.83E and excavated in 10 cm levels to a depth of 40 cm where a posthole test was excavated an additional 50 cm to 90 cm. One piece of chert shatter and 1 piece of fire-cracked chert were recovered from level 3 (20 cm - 30 cm). Three strata were revealed in Test Unit 1 (Figure 38). Stratum 1 was a dark grayish brown (10YR4/3) silt loam that extended to the base of the plowzone at 10 cm. Stratum 2 was a very dark grayish brown (10YR3/2) silt loam that extended to 37 cm. Stratum 3 was a brown to dark brown (10YR4/3) silt loam that extended to the base of the excavation.

Test Unit 2 was placed at 105.99S/158.18E and excavated in 10 cm levels to a depth of 40 cm where a posthole test was excavated an additional 20 cm to 60 cm. No cultural materials were recovered. Subsequently, a backhoe trench was excavated surrounding the unit and the test unit reestablished at a depth of 390 cm. Excavation proceeded in 10 cm levels to 410 cm where a posthole test was excavated an additional 50 cm to 460 cm. Again, no cultural materials were recovered. Three strata were identified in the excavation of Test Unit 2 (Figure 39; Photograph 7). Stratum 1 was a very dark grayish brown (10YR3/2) silt loam that extended to about 94 cm. Stratum 2 was a brown to dark brown (7.5YR4/4) clay loam that extended to 120 cm. Stratum 3 was a brown to dark brown (10YR4/3) loamy clay that extended to the base of the excavation.

Test Unit 3 was placed at 144.3S/190.32E and excavated in 10 cm levels to a depth of 40 cm where a posthole test was excavated an additional 40 cm to 80 cm. One retouch flake and a piece of amethyst glass were recovered from level 2. Subsequently, a backhoe trench was excavated surrounding the area and Test Unit 3 reestablished at 400 cm. Excavation proceeded in 10 cm levels to 420 cm where a posthole test was excavated an additional 40 cm to 460 cm. No cultural materials were recovered. During the preparation of the deep test for excavation, an irregular stain was found in the east wall of the backhoe trench at a depth of about 270 cm that contained large amounts of charcoal and burned clay. The area around the stain was cleaned and prepared for excavation and designated as Test Unit 3A. Subsequent work clearly showed the stain to be a burned tree stump. Four strata were revealed in the excavation of Test Unit 3 (Figure 40). Stratum 1 was a brown to dark brown (10YR4/3) silt loam that extended to the base of the plowzone at about 13 cm. Stratum 2 was a very dark grayish brown (10YR3/2) silt loam that extended to depths ranging from 64 cm to 89 cm. Stratum 3 was a brown to dark brown (7.5YR4/4) loamy clay that extended to 120 cm. Stratum 4 was a brown to dark brown (10YR4/3) loamy clay with brown (10YR5/3) mottling that extended to the base of the excavation.

Test Unit 4 was placed at 24.19S/115.65E and excavated in 10 cm levels to 40 cm where a posthole test was excavated an additional 50 cm to 90 cm. A fencing staple was recovered from Level 1, while Level 3 yielded a piece of chert shatter, 2 pieces of fire-cracked rock and 2 retouch flakes. Three strata were encountered in Test Unit 4 (Figure 41). Stratum 1 was a dark brown

TEST UNIT 1 WEST WALL PROFILE

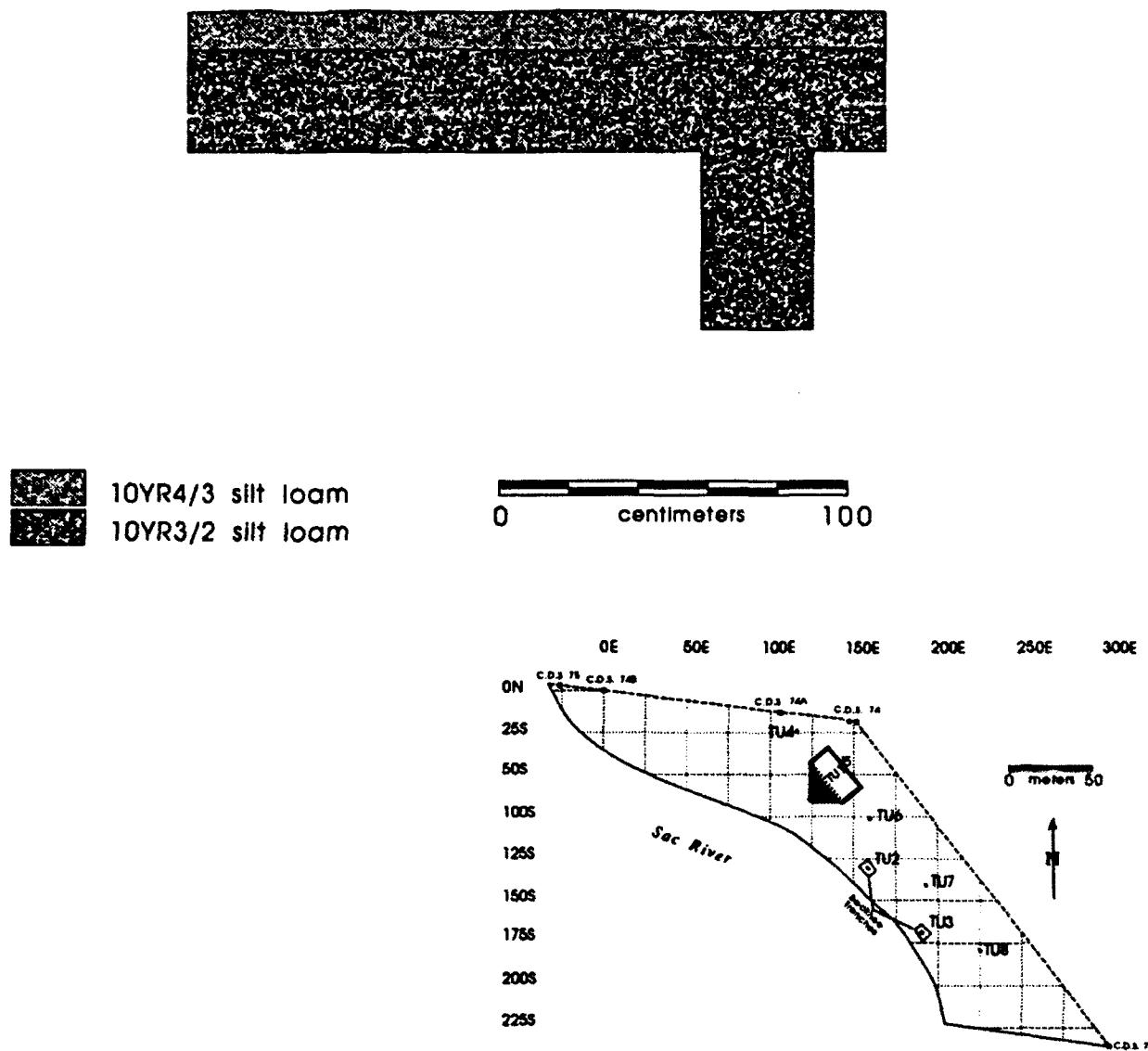


Figure 38. Profile of Test Unit 1 at 23CE446.

TEST UNIT 2 WEST WALL PROFILE

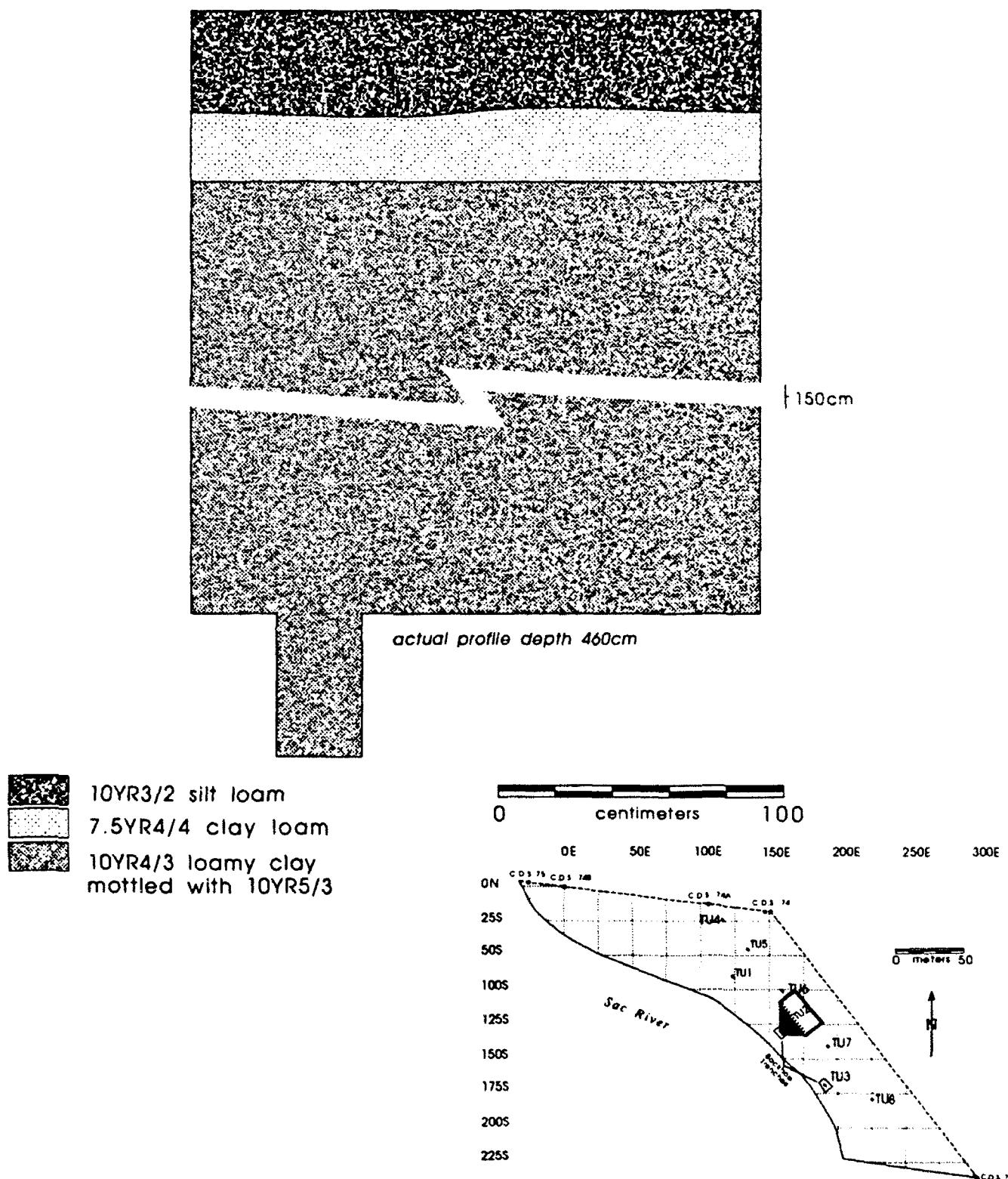


Figure 39. Profile of Test Unit 2 at 23CE446.



Photograph 7. Completed excavation of Test Unit 2 at 23CE446.

TEST UNIT 3 WEST WALL PROFILE

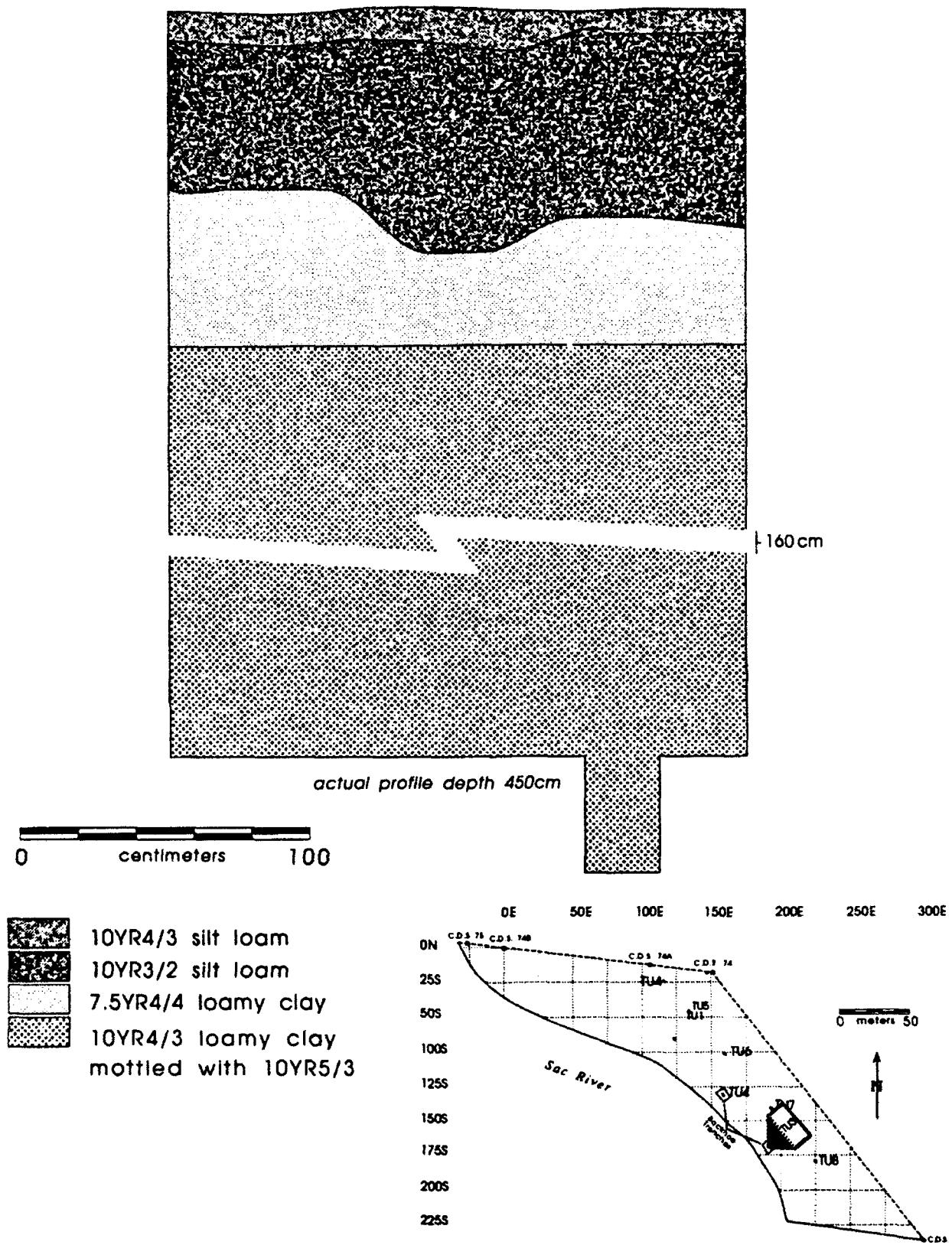
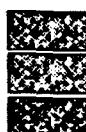
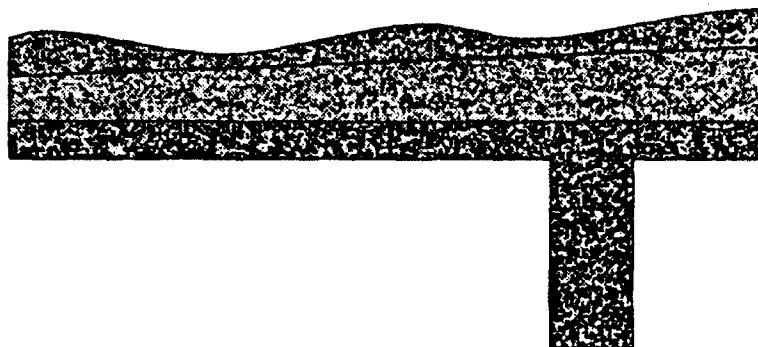


Figure 40. Profile of Test Unit 3 at 23CE446.

TEST UNIT 4 WEST WALL PROFILE



10YR3/3 silt loam (plowzone)

10YR3/2 and 10YR3/3 silt loam

10YR4/2 silt loam

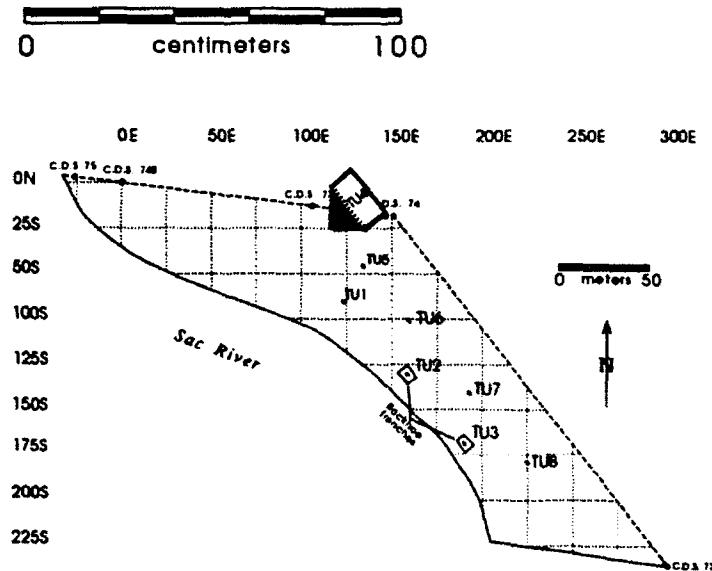


Figure 41. Profile of Test Unit 4 at 23CE446.

(10YR3/3) silt loam that extended to the base of the plowzone at 10 cm. Stratum 2 was a very dark grayish brown (10YR3/2) to dark brown (10YR4/3) silt loam that extended to 30 cm. Stratum 3 was a hard pan that extended to the base of the excavation and ranged in color from dark grayish brown (10YR4/2) to dark brown (7.5YR3/2) to very dark grayish brown (10YR3/2) silt loam, depending on the moisture content.

Test Unit 5 was placed at 45.64S/133.65E and excavated in 10 cm levels to a depth of 30 cm where a posthole test was excavated an additional 40 cm to 70 cm. No cultural materials were recovered. Two strata were identified during the excavation of Test Unit 5 (Figure 42). Stratum 1 was a brown to dark brown (10YR4/3) silt loam that extended to the base of the plowzone 20 cm below surface. Stratum 2 was a very dark grayish brown (10YR3/2) silt loam that extended to the base of the excavation.

Test Unit 6 was placed at 76.28S/159.36E and excavated in 10 cm levels to 60 cm where a posthole test was excavated an additional 50 cm to 110 cm. Thirty-six cultural and non-cultural items were recovered from levels 4 and 5 (30 cm - 50 cm), 43% of the site total. These included a dart point stem, 4 pieces of fire-cracked rock, 3 broken flakes, 12 interior flakes, 1 primary decortication flake, 7 retouch flakes, 3 secondary decortication flakes and 5 pieces of chert shatter. Twenty-nine of these items were recovered from Level 5. A Beaver Lake-like lanceolate biface (Cat. No. 21-1) manufactured from Burlington Chert was recovered in the matrix from Level 6 (40 cm - 50 cm). This Late Paleo-Indian/Early Archaic biface weighs 13.3 g and measures 4.37 cm (broken) x 2.74 cm x .94 cm. The point has been resharpened by pressure-flaking, the blade having snapped under some force. Use-polish is evident on the remaining blade edges. After the tool was broken, one corner was used as a burin, resharpened and used again. The biface was finally discarded after its second resharpening. This tool functioned as a cutting implement after which it was used as a burin or engraving tool. Four strata were identified during the excavation of Test Unit 6 (Figure 43). Stratum 1 was a dark brown (10YR3/3) silt loam that extended to the base of the plowzone 22 cm - 30 cm deep. Stratum 2 was a very dark grayish brown (10YR3/2) silt loam that extended to 32 cm - 40 cm. Stratum 3 was a brown (10YR5/3) silt loam that extended to 100 cm. Stratum 4 was a dark yellowish brown (10YR4/4) silt loam that extended to the base of the excavation.

Test Unit 7 was placed at 116.11S/192.79E and excavated in 10 cm levels to 50 cm where a posthole test was excavated an additional 50 cm to 100 cm. Six cultural and non-cultural items were recovered from levels 1 through 4 (0 cm - 40 cm). These included 1 piece of window glass, 1 piece of mussel shell, 1 primary decortication flake, 1 interior flake, 1 piece of fire-cracked rock and 1 piece of sandstone. Three strata were identified during excavation (Figure 44). Stratum 1 was a dark brown (10YR3/3) silt loam that extended to the base of the plowzone at 12 cm below surface. Stratum 2 was a dark grayish brown (10YR4/2) silt loam that extended to 20 cm - 28 cm and may represent the depth of chisel plowing. Stratum 3 was a compact silt loam hard pan that ranged in color from very dark grayish brown (10YR3/2) to brown (7.5YR4/4) to dark brown (7.5YR3/2), depending on the moisture content, and extended to the base of the excavation.

TEST UNIT 5 WEST WALL PROFILE

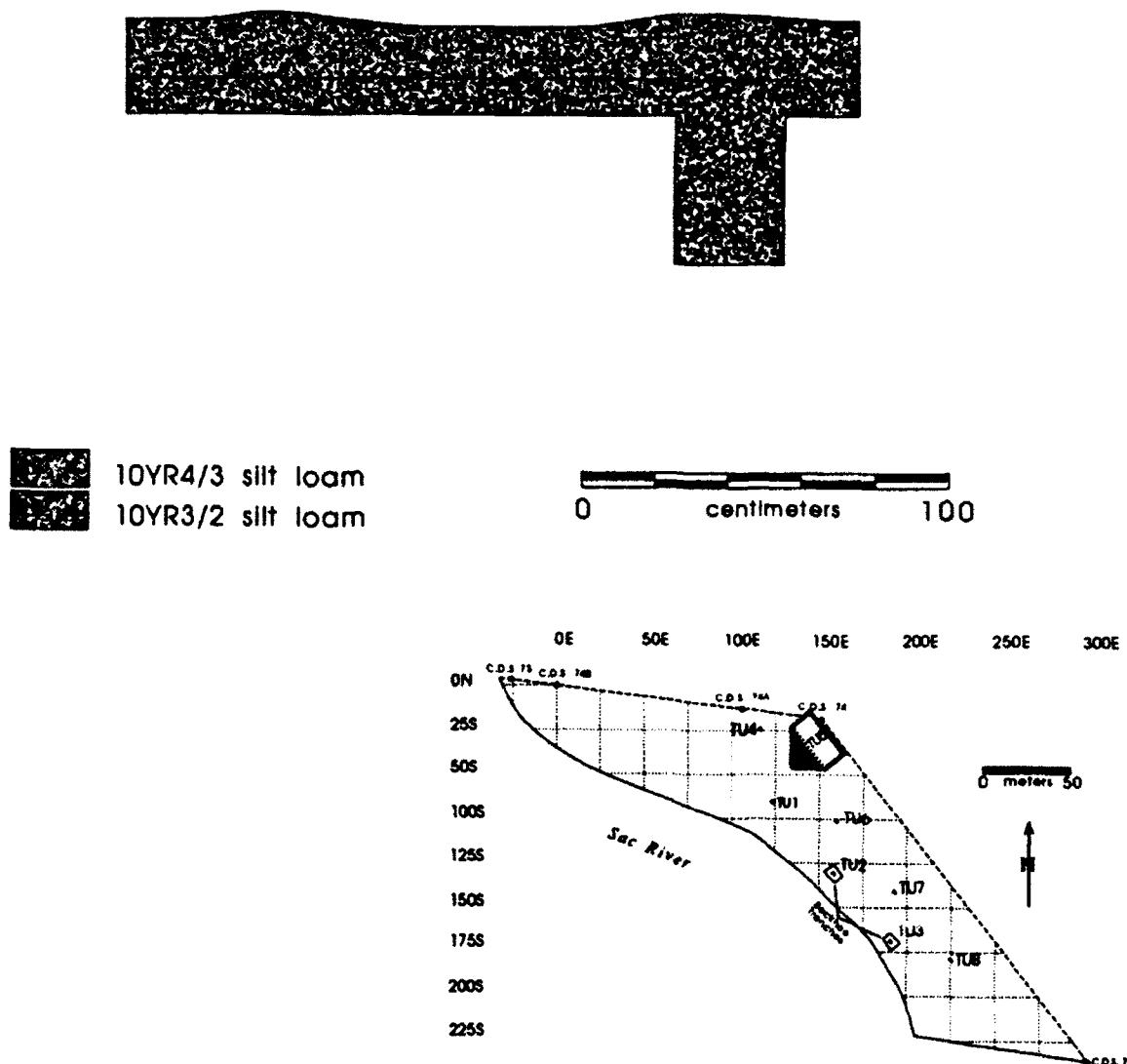


Figure 42. Profile of Test Unit 5 at 23CE446.

TEST UNIT 6 WEST WALL PROFILE

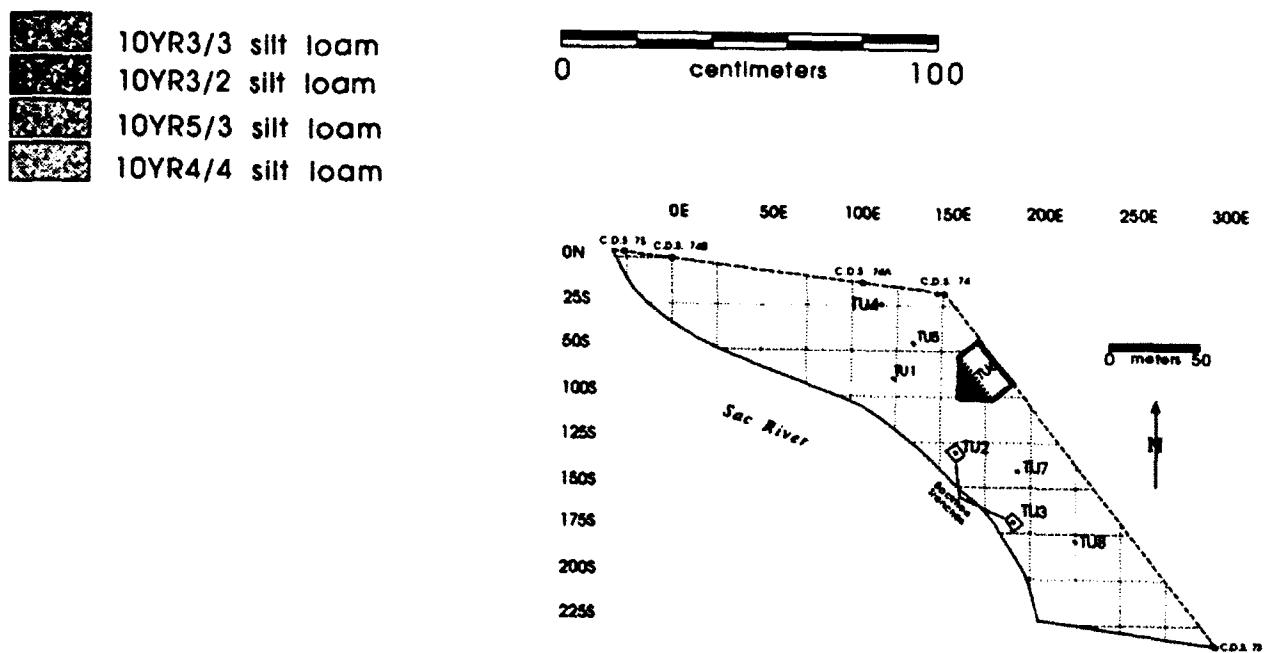


Figure 43. Profile of Test Unit 6 at 23CE446.

TEST UNIT 7 WEST WALL PROFILE

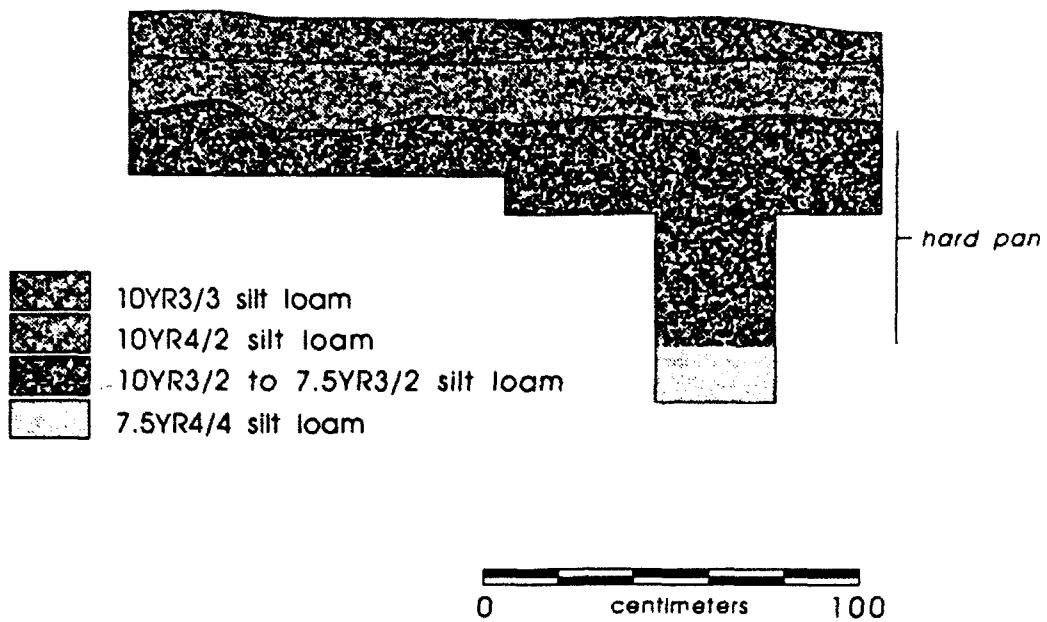


Figure 44. Profile of Test Unit 7 at 23CE446.

Test Unit 8 was placed at 154.41S/224.93E and excavated in 10 cm levels to 40 cm where a posthole test was excavated an additional 50 cm to 90 cm. No cultural materials were recovered. Two strata were identified during the excavation of Test Unit 8 (Figure 45). Stratum 1 was a brown to dark brown (10YR4/3) silt loam that reached a depth of 36 cm to 38 cm. Stratum 2 was a very dark grayish brown (10YR3/2) silt loam that extended to the base of the excavation.

Horizontal and Vertical Extent - The cultural deposits are so sparse that making an informed estimate of site size is nearly impossible. Most of the excavations that yielded cultural materials (with the exception of Test Unit 4) occurred in an area about 107 m x 46 m (4,922 m²), but we have little faith that this is an accurate reflection of the true size of 23CE446. In addition, the deposits are shallow. Only in Test Unit 6, where materials occurred to 50 cm below surface, were cultural materials found in any quantity below a depth of 30 cm.

Cultural Affiliation - The cultural affiliation of 23CE446 has not yet been determined. The Dalton Serrated point recovered from the river, along with the Beaver Lake-like lanceolate point, suggest use of the site during the Early Archaic Period and possibly Dalton times. We hasten to point out, however, that no evidence of a deeply buried Dalton Period component was recovered from the deep tests or from an inspection of the river bank. It is possible that the Dalton point represents recycling of a discarded or lost tool by later peoples. We are also reluctant to define an Early Archaic component on the basis of a single dart point.

Site Function - Activities suggested by the artifacts recovered include food preparation, hunting/butchering, stone tool manufacture and maintenance and refuse disposal. The extremely low artifact density and limited activities indicated by the artifacts, when combined with an absence of evidence of long-term habitation, such as structural remains, storage facilities and midden accumulation, suggest only sporadic use of the site for hunting or possibly exploitation of riverine resources.

Site Integrity - The site has suffered damage from clearing, cultivating and surface erosion, as have many other sites in the area. River migration is serious as well. Our mapping shows that river bank erosion near 23CE446 has removed about 20 m since the 1:4,800 scale maps were made. ESA investigators characterized 23CE446 as a moderate density lithic scatter and it is possible that the materials remaining represent the fringe of a site that has been largely destroyed by river meandering, since the deposits observed during the testing did not approach anything resembling moderate density.

Significance Assessment - Our work at 23CE446 failed to produce data that would make it eligible for inclusion in the National Register of Historic Places. Our assessment in connection with 23CE446 is based on a lack of significant data being present at the site. There is no evidence of structural remains or other features exist at the site. There is similarly no evidence that midden deposits or other discrete artifact concentrations are present in any strata at any depth. No datable contexts have been found at the site and none are likely to exist. There is also no indication that floral or faunal material or human remains have been preserved at the site. The combination of these characteristics have lead us to conclude that significant deposits do not occur at 23CE446.

TEST UNIT 8 WEST WALL PROFILE

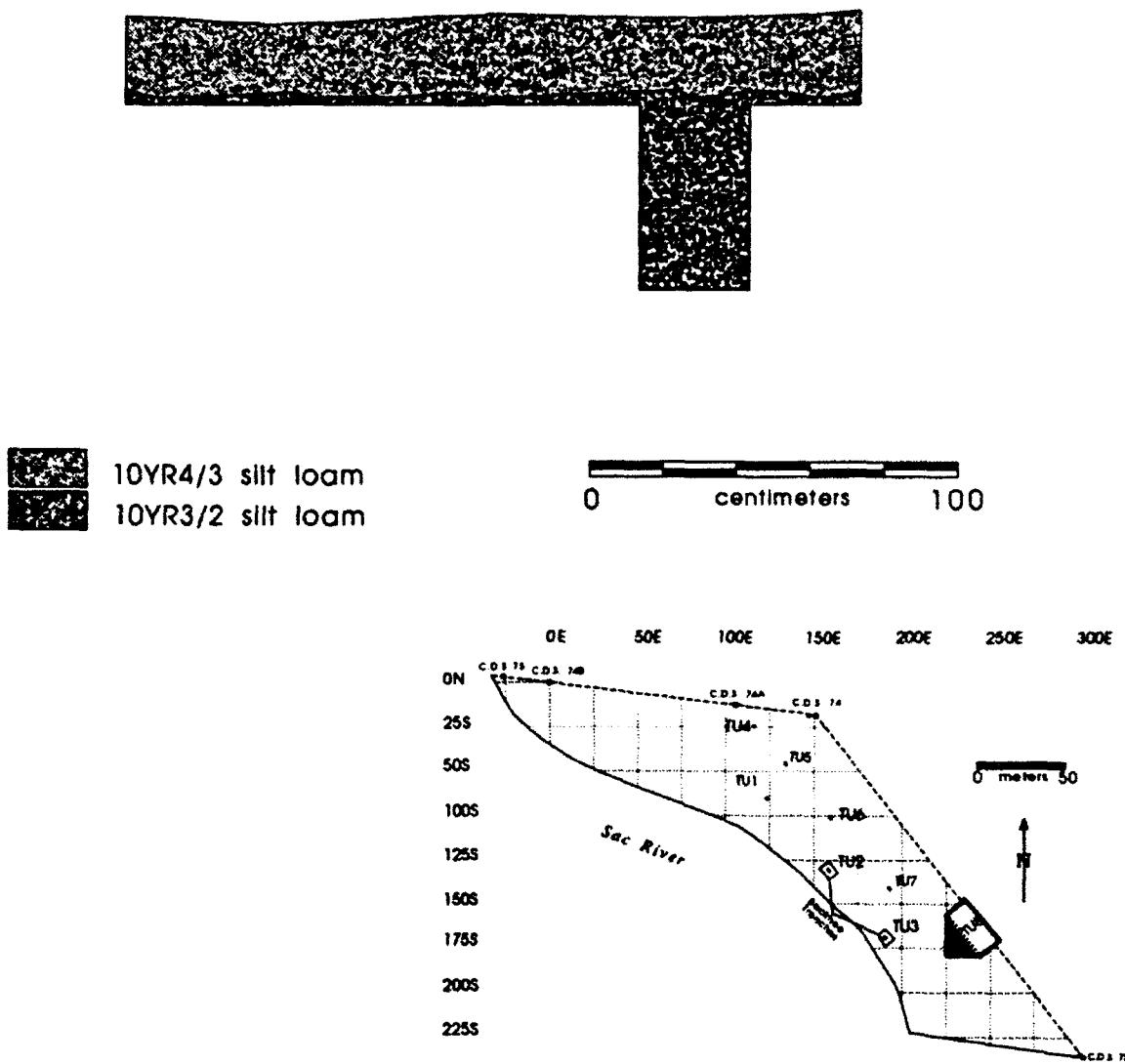


Figure 45. Profile of Test Unit 8 at 23CE446.

Our excavations were so uniformly unproductive that we believe any additional work would produce only scant redundant data. No further work is recommended for 23CE446.

23SR291

There are 2 locations for 23SR291. The described location is on the wooded talus slope east of Rockhouse Cave. The location shown on the USGS topographic map accompanying the state site form, and the location of our work, is on the floodplain south of Rockhouse Cave. Tract 2702E-1 is situated on the west side of the Sac River, immediately south of the sandstone bluff that forms Rockhouse Cave. This area is apparently a former agricultural field, given the thick growth of weeds, grasses and saplings. Care should be taken not to apply the our findings to the talus slope in front of Rockhouse Cave. That location is outside government easements and has not been investigated.

Our work at 23SR291 took place between 21 and 30 August 1990. The boundaries of Tract 2702E-1 were first resurveyed to confirm that we were in the correct location and to establish the limits of our work area. By using the original survey notes and topographic maps provided by the Kansas City District, we relocated COE survey markers 38 and 39. Both were clearly marked on the ground and easily relocated. Subsequent investigations included the excavation of 10 posthole tests and one 1 m x 2 m test unit (Figure 46). As a result, 444 items (Table 15), both cultural and non-cultural, were recovered as well as information on the nature and extent of the cultural deposits.

Table 15. Artifacts recovered from 23SR291.

Artifact Description	Ct	Wt (g)			
Aluminum foil	6	3.8	Glass, opaque-white	2	0.8
Battery, carbon rod	1	5.1	Metal, unidentified	267	367.9
Biface fragment	1	5.3	Miscellaneous aluminum	1	0.7
Bottle cap	7	33.0	Mussel shell	11	117.8
Burned clay	1	0.4	Nail, forged	5	11.3
Charcoal, unidentified	37	3.0	Penny, 1967	1	3.1
Fire-cracked rock	2	6.8	Plastic, miscellaneous	16	3.6
Flake, broken	2	1.2	Pull tab, aluminum	5	3.8
Flake, interior	1	1.0	Sandstone	2	49.2
Flake, modified	1	0.6	Shatter	9	26.1
Flake, primary decor	1	0.4	Shell casing 22 caliber	8	6.4
Flake, retouch	2	0.9	Tin can fragment	13	78.1
Glass, brown bottle	7	6.3	Unmodified chert	1	1.6
Glass, clear bottle	8	14.8	Unmodified stone	2	2.8
Glass, green bottle	24	38.3	Total	444	794.1

Artifacts visible on the surface included only modern historic trash that was not deemed worthy of substantial effort to plot and recover. In addition, surface visibility over virtually all the tract was nil, making surface collecting impossible. Ten posthole tests excavated to depths of 150 cm along the southern boundary of the tract, yielded 9 artifacts. These included 4 sherds of clear bottle glass, 1 modified flake, 3 pieces of chert shatter and 1 piece of unmodified chert.

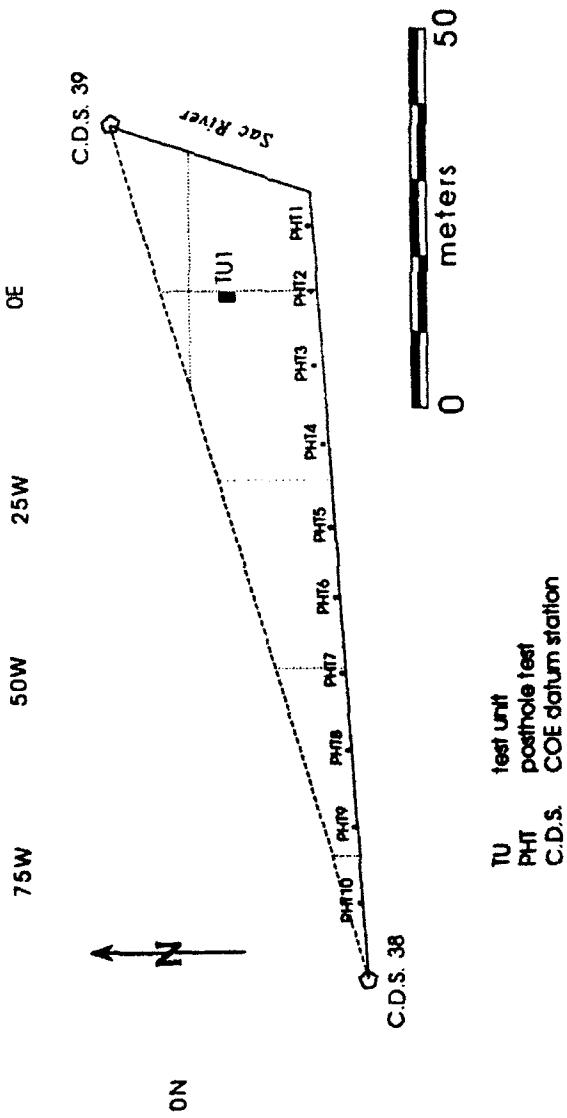


Figure 46. HPA investigations at 23SR291.

One 1 m x 2 m test unit was established at grid coordinate 4S/0E and excavated in 10 cm levels to 50 cm where it was stepped down to 1 m x 1 m (north half) and excavated to 90 cm. At that point, a posthole test was excavated an additional 130 cm to 220 cm. Excavated soil was screened through ¼ inch mesh hardware cloth and the cultural materials recovered placed in paper nail bags labeled with the site number, test unit number, level number, date and the initials of the excavator and screener. Upon completion, one wall was drawn in profile and photographed in black and white and color slides.

Four hundred thirty-five items were recovered from Test Unit 1 to a depth of 90 cm, of which about 96% were historic. Prehistoric materials included 1 biface fragment, 1 piece of burned clay, 2 pieces of fire-cracked rock, 2 broken flakes, 1 interior flake, 1 primary decortication flake, 2 retouch flakes, 2 pieces of sandstone, and 6 pieces of chert shatter. The tip of a bifacial cutting implement (Cat. No. 7-17) was found in Level 1 (0 cm - 10 cm). This artifact is manufactured from Reeds Spring chert, weighs 5.3 g and measures 3.47 cm x 2.27 cm x .62 cm. The edges of the tip have been crushed and show evidence of use-rounding and use-polish. The artifact had been resharpened by pressure-flaking. An analysis of the tip indicates that it was used in butchering activities with substantial contact with bone (see Dickson 1991). Four strata were identified during the excavation of Test Unit 1 (Figure 47; Photograph 8). Stratum 1 was a very dark grayish brown (10YR3/2) silty clay loam that extended to 90 cm, becoming mottled below 60 cm. Stratum 2 was a brown (10YR4/3) silt loam that extended to 110 cm. Stratum 3 was a brown (10YR4/3) silty clay loam that extended to 170 cm. Stratum 4 was a brown (10YR4/3) silty clay that extended to the base of the excavation where the water table was encountered.

Horizontal and Vertical Extent - Cultural materials, composed mostly of historic debris, are scattered throughout Tract 2702E-1 and occur as deeply as 150 cm but normally no deeper than 90 cm. Our investigations revealed that the plotted location of 23SR291, which is on the floodplain south of Rockhouse Cave, is incorrect and that the place described by ESA investigators is east of Rockhouse Cave and outside Government easements.

Cultural Affiliation - The cultural affiliation of 23SR291 includes Twentieth Century Historic and indeterminate prehistoric. It is not known if the prehistoric materials recovered are associated with Rockhouse Cave to the north or 23SR1060 to the south.

Site Function - A functional assessment of the area tested in Tract 2702E-1 is not possible and, indeed, probably inadvisable. Given the mixing apparent in Test Unit 1, it is possible that the prehistoric materials recovered have been redeposited either from Rockhouse Cave or from the hilltop overlooking the tract, if a site is located there. It is also possible that these materials are associated with 23SR1060, which is located a short distance to the south, but our work area was too small to make such a determination.

Site Integrity - The site has suffered damage from clearing, and probably cultivating, as have many other sites in the area. River migration does not appear to have had serious impact. Our excavations show that the historic and prehistoric deposits are thoroughly mixed and, therefore, have little data potential.

TEST UNIT 1 EAST WALL PROFILE

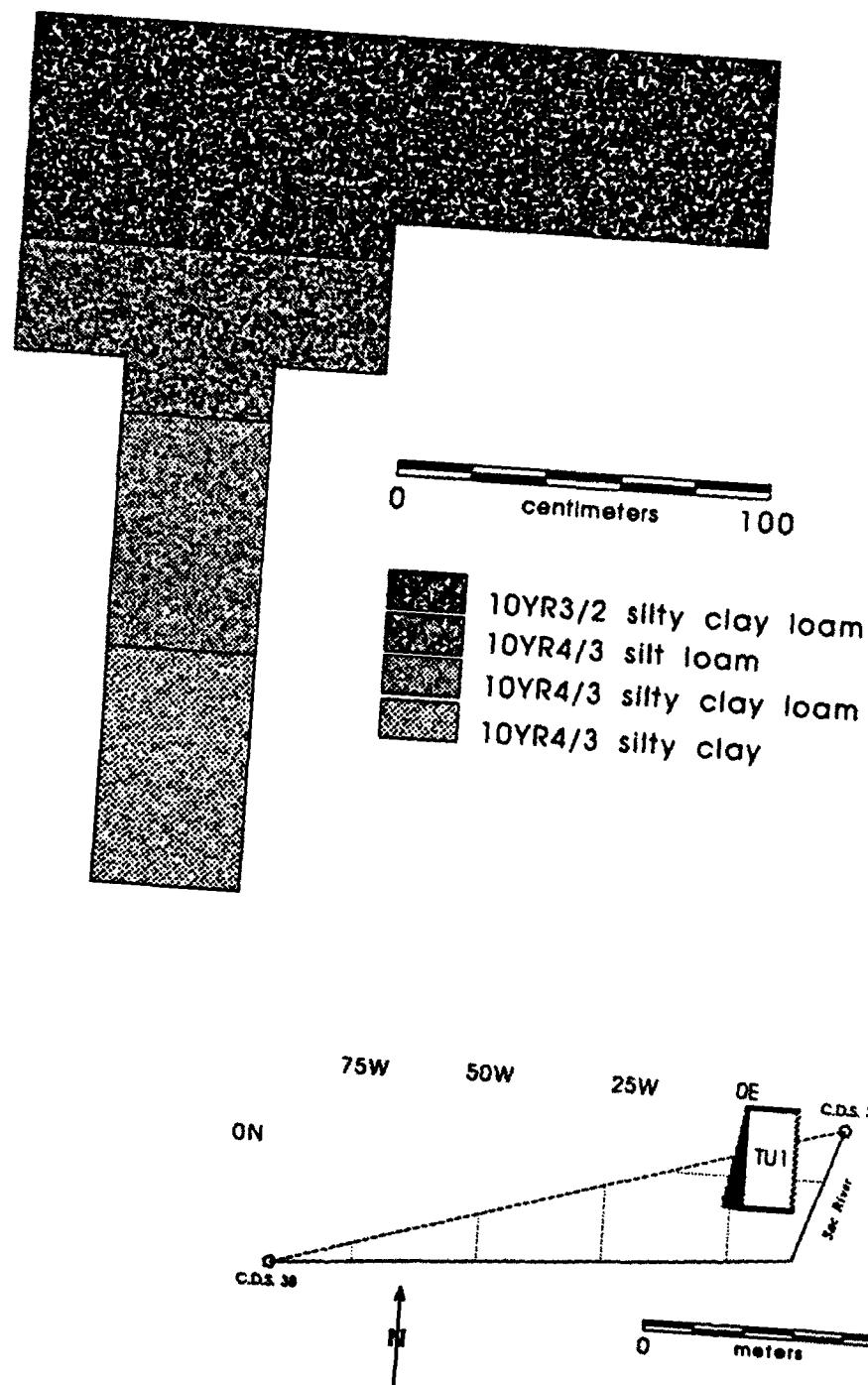


Figure 47. Profile of Test Unit 1 at 23SR291.



Photograph 8. Excavation of Test Unit 1 at 23SR291.

Significance Assessment - Our work at 23SR291 failed to produce data that would make the site eligible for inclusion in the National Register of Historic Places. The location tested during this project is not on the talus slope in front of Rockhouse Cave and, therefore, no new data regarding activities associated with Rockhouse have been produced. The prehistoric materials recovered from our excavations are thoroughly mixed with historic materials and of uncertain origin. Our assessment in connection with 23SR291 is based on a lack of significant data being present at the site. There is no evidence of structural remains or other features exist at the site. There is similarly no evidence that midden deposits or other discrete artifact concentrations are present in any strata at any depth. No datable contexts have been found at the site and none are likely to exist. There is also no indication that floral or faunal material or human remains have been preserved at the site. The combination of these characteristics have lead us to conclude that significant deposits do not occur at 23SR291. No further work is recommended in Real Estate Tract 2702E-1.

23SR1067

23SR1067 is in a pasture on the east side of the Sac River and roughly 900 m south of U.S. Highway 54. Vegetation on and surrounding the site consists of grasses and scattered hardwoods. Three east-west running drainage ditches have been excavated across the site to drain a low-lying area north and east of Tract 2603E. The river bank at the southern end of the tract is heavily vegetated but over most of the remainder of the tract it has been denuded by erosion (Photograph 9).

Our work at 23SR1067 took place between 4 September and 17 October 1990. The boundaries of the easement were first resurveyed to confirm that we were in the correct location and to establish the limits of our work area. By using the original survey notes and topographic maps provided by the Kansas City District, we relocated COE survey markers 117, 117A, 118, 119, 119A and 120. All but 118 were clearly marked on the ground and easily relocated. Subsequent investigations included the excavation of 25 posthole tests, 7 1 m x 2 m test units and one 1 m x 1 m test unit (Figure 48). As a result, 1,124 items (Table 16), both cultural and non-cultural, were recovered as well as information on the nature and extent of the cultural deposits.

So few artifacts were visible on the surface that surface collecting was deemed inappropriate as a means of assessing site dimensions. Twenty-five posthole tests were selectively placed to provide information of the horizontal distribution of artifacts. In the north half of the site where test units had shown that a buried component existed, these tests (1 through 11) were excavated to a depth of one meter. In the south half of the site, where no evidence of a buried component was found, they (12 through 25) were excavated to 50 cm. Ten of the 25 tests (3, 9, 10, 11, 15, 21, 22, 23, 24 and 25) yielded cultural materials, including: 1 piece of fire-cracked chert, 5 pieces of fire-cracked sandstone, 1 broken flake, 4 interior flakes, 1 primary decortication flake, 4 retouch flakes, 19 pieces of unmodified sandstone and 2 pieces of chert shatter. In addition, several items were found in the river. A beveled unifacial preform (Cat. No. 10-1) that was recycled as a scraper after it had broken was found in the river. This scraper is manufactured from heat-treated Reeds Spring chert, weighs 21.9 g and measures 4.8 cm x 4.0 cm x 1.2 cm. The medium polish on the edges suggests that this tool was used scrape skins, possibly



Photograph 9. General view along the Sac River of 23SR1067.

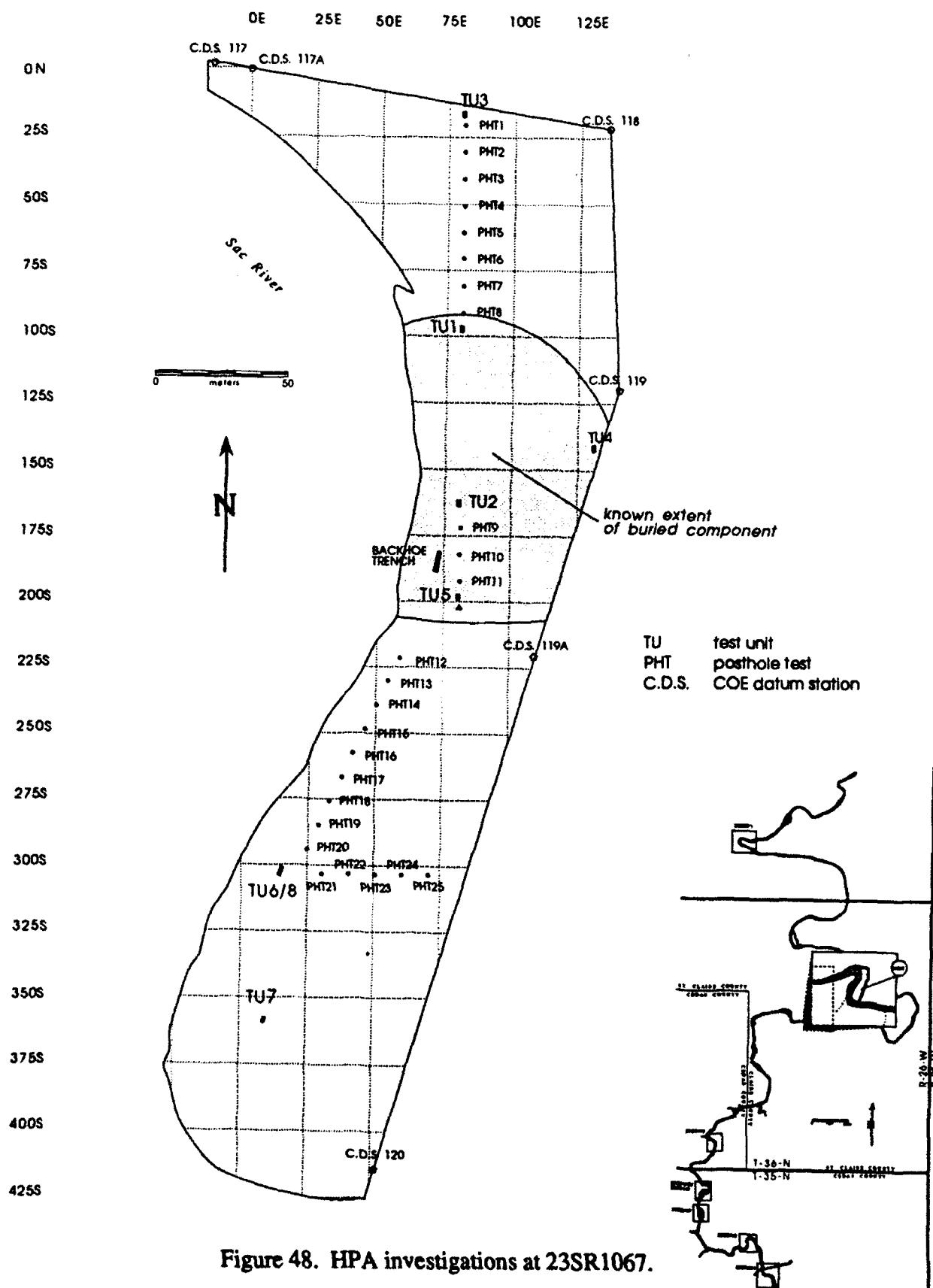


Figure 48. HPA investigations at 23SR1067.

during the Woodland Period. The distal end of a biface tip (Cat. No. 10-2) was recovered from the river. This tool was manufactured from Jefferson/Cotter chert undifferentiated Variety 2, weighs 6.5 g and measures 5.28 cm x 2.0 cm x .75 cm. The tip snapped from the blade as a result of pressure applied to it and also shows evidence of edge crushing and use-polish from butchering activities. A Smith point (Cat. No. 10-3) was also found in the river. The point has basal notches, is manufactured from Reeds Spring chert, weighs 26.4 g and measures 4.5 cm x 4.8 cm x 1.0 cm. This point has a wide thick blade with heavy use-rounding, use-polish on the edges and some edge crushing, all indicative of cutting and possible butchering activities. Smith points date to the Late Archaic Period (3000 BC - 1000 BC). An expanding stemmed dart point (Cat. No. 10-4) was found in the river. This point is manufactured from Jefferson City/Cotter undifferentiated chert (Mozarkite), weighs 4.1 g and measures 2.92 cm x 2.31 cm x .65 cm. It has been resharpened many times down to a stub, is missing one barb and exhibits a possible impact fracture. Although not assignable to any specific established type, this artifact almost surely reflects Late Archaic Period activities. An Adena-like point (Cat. No. 10-5) was also found in the river. This tool is manufactured from heat-treated oolitic Jefferson City/Cotter undifferentiated chert, weighs 28.7 g and measures 8.2 cm x 3.78 cm x 1.02 cm. The wide blade on this point shows some rounding and a significant amount of use-polish, both indicative of butchering activities. Adena points date from the Late Archaic to Early Woodland periods (3000 BC to 500 BC).

Table 16. Artifacts recovered from 23SR1067.

Artifact Description	Ct	Wt (g)				
Biface fragment	1	6.5	Flake, interior	258	289.9	
Bifacial scraper	1	21.9	Flake, primary decort	6	17.3	
Charcoal, unidentified	2	0.5	Flake, retouch	358	116.3	
Cobble, unmodified	3	3.7	Flake, secondary decort	12	18.8	
Core	2	194.8	Ground stone, misc	2	336.6	
Dart point (Adena?)	1	28.7	Metal, unidentified	1	0.2	
Dart point (Smith)	1	19.1	Preform fragment	1	66.4	
Dart point stem/base	2	7.5	Pull tab, aluminum	2	1.3	
Dart point stem/base (Smith)	1	26.4	Sand-tempered plain body	1	0.1	
Fire-cracked chert	1	0.8	Sandstone	109	1175.8	
Fire-cracked rock	211	1432.7	Shatter	113	246.1	
Flake, broken	32	19.0	Unmodified stone	3	40.9	
			Total	1124	4071.3	

Seven 1 m x 2 m test units and one 1 m x 1 m unit were established at grid coordinates 95S/79E, 160S/79E, 15S/79E, 139S/130E, 195S/79E, 297.57S/14.76E, 358.04S/9.21E and 299.99S/14.06E. These were excavated in 10 cm levels by troweling and shovel skimming. Excavated soil was screened through ¼ inch mesh hardware cloth and the cultural materials recovered placed in paper nail bags labeled with the site number, test unit number, level number, date and the initials of the excavator and screener. Excavation proceeded until a culturally sterile level was encountered, at which point a posthole test or 50 cm x 50 cm shovel test was excavated an additional 50 cm in 10 cm levels to confirm that the base of the deposits had been reached. Upon completion, one wall was drawn in profile and photographed in black and white and color slides.

Test Unit 1 was placed at 95S/79E and excavated in 10 cm levels to a depth of 100 cm where it was stepped down to 1 m x 1 m (north half) and further excavated to 120 cm. At that level, a posthole test was excavated an additional 140 cm to 260 cm. One hundred fifty artifacts were recovered from levels 1 through 10 (0 cm - 100 cm), concentrating in levels 8 and 9 where 124 (83%) items were recovered. These included 1 core, 3 pieces of fire-cracked rock, 9 broken flakes, 62 interior flakes, 2 primary decortication flakes, 52 retouch flakes, 2 secondary decortication flakes, 1 piece of unidentified metal, 2 aluminum pull tabs, 3 pieces of unmodified sandstone and 13 pieces of chert shatter. Three strata were revealed in Test Unit 1 (Figure 49). Stratum 1 was a very dark grayish brown (10YR3/2) silt loam that extended to 43 cm to 54 cm. Stratum 2 was a brown to dark brown (10YR4/3) silt loam that extended to 200 cm, becoming more mottled with depth. Stratum 3 was a grayish brown (10YR5/2) silty clay loam with strong brown (7.5YR4/6) mottling that extended to the base of the posthole test.

Test Unit 2 was placed at 160S/79E and excavated in 10 cm levels to a depth of 130 cm where it was stepped down to 1 m x 1 m (N½) and further excavated to 160 cm. At that point a posthole test was excavated an additional 140 cm to 300 cm. One hundred forty-five artifacts were recovered from Levels 3 through 14 (20 cm - 140 cm) and Level 20 (200 cm - 220 cm) in the posthole test including 2 pieces of charcoal, 1 piece of fire-cracked rock, 5 broken flakes, 47 interior flakes, 1 primary decortication flake, 68 retouch flakes, 1 fragment of a ground stone tool and 20 pieces of chert shatter. One hundred twenty-four (85%) artifacts were recovered from levels 12 and 13 (110 cm - 130 cm). Four strata were revealed in Test Unit 2 (Figure 50). Stratum 1 was a very dark grayish brown (10YR3/2) silt loam that extended to 30 cm - 48 cm. Stratum 2 was a very dark brown (10YR2/2) silt loam that extended to 77 cm - 90 cm. Stratum 3 was a grayish brown (10YR5/2) silty clay loam with dark yellowish brown (10YR4/4) and gray (10YR5/1) mottling that extended to 220 cm. Stratum 4 was a dark yellowish brown (10YR3/4) silty clay with gray mottling (10YR5/1) that extended to the base of the excavation.

Test Unit 3 was placed at 15S/79E. The first 5 levels were removed with a backhoe, since the results of Test Units 1 and 2 showed that the main concentration of cultural material occurred below that depth. From that point, excavation proceeded in 10 cm levels to a depth of 100 cm where the unit was stepped down to 1 m x 1 m (north half) and further excavated to 120 cm. There, a posthole test was excavated an additional 80 cm to 200 cm. Twenty-seven items were recovered from levels 6 through 10 (50 cm - 100 cm), including 10 pieces of fire-cracked rock, 1 broken flake, 7 interior flakes, 5 retouch flakes, 1 secondary decortication flake and 3 pieces of shatter. Four strata were revealed in the excavation of Test Unit 3 (Figure 51). Stratum 1 was a very dark grayish brown (10YR3/2) silt loam that extended to about 30 cm. Stratum 2 was a brown to dark brown (10YR4/3) silt loam that extended to 80 cm - 94 cm. Stratum 3 was a gray (10YR5/1) silty clay loam that graded into Stratum 4, a gray (10YR5/1) silty clay, at about 110 cm. Stratum 4 extended to the base of the excavation.

Test Unit 4 was placed at 139S/130E. The first 50 cm were removed with a backhoe and excavation proceeded from that point in 10 cm levels to 110 cm where the unit was stepped down to 1 m x 1 m (N½) and further excavated to 130 cm. At that point, a posthole test was excavated an additional 120 cm to 250 cm. Four hundred fifty-five cultural and non-cultural items were recovered from Test Unit 4 to a depth of 120 cm, including: 1 dart point, 1 dart point stem,

TEST UNIT 1 WEST WALL PROFILE

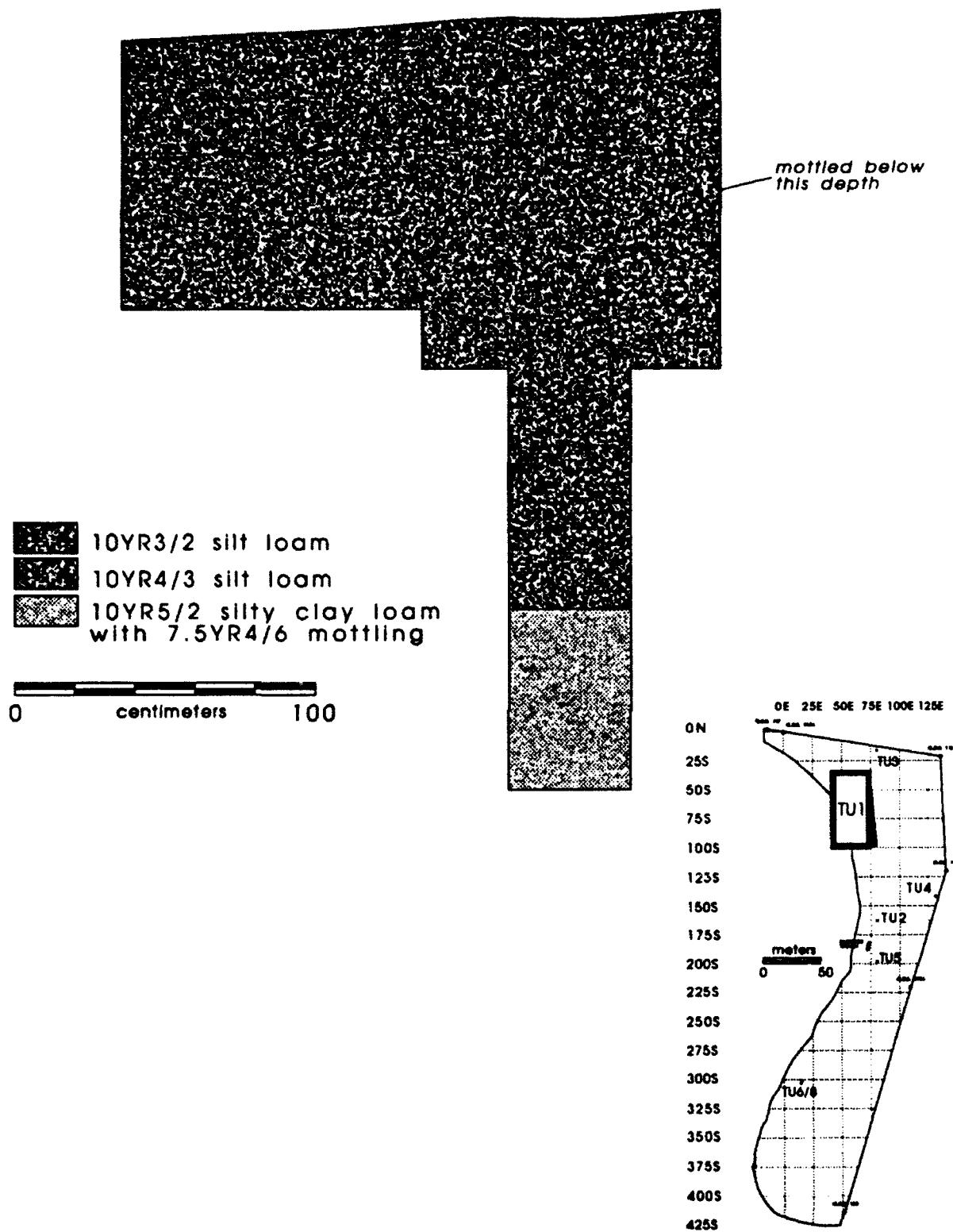


Figure 49. Profile of Test Unit 1 at 23SR1067.

TEST UNIT 2 WEST WALL PROFILE

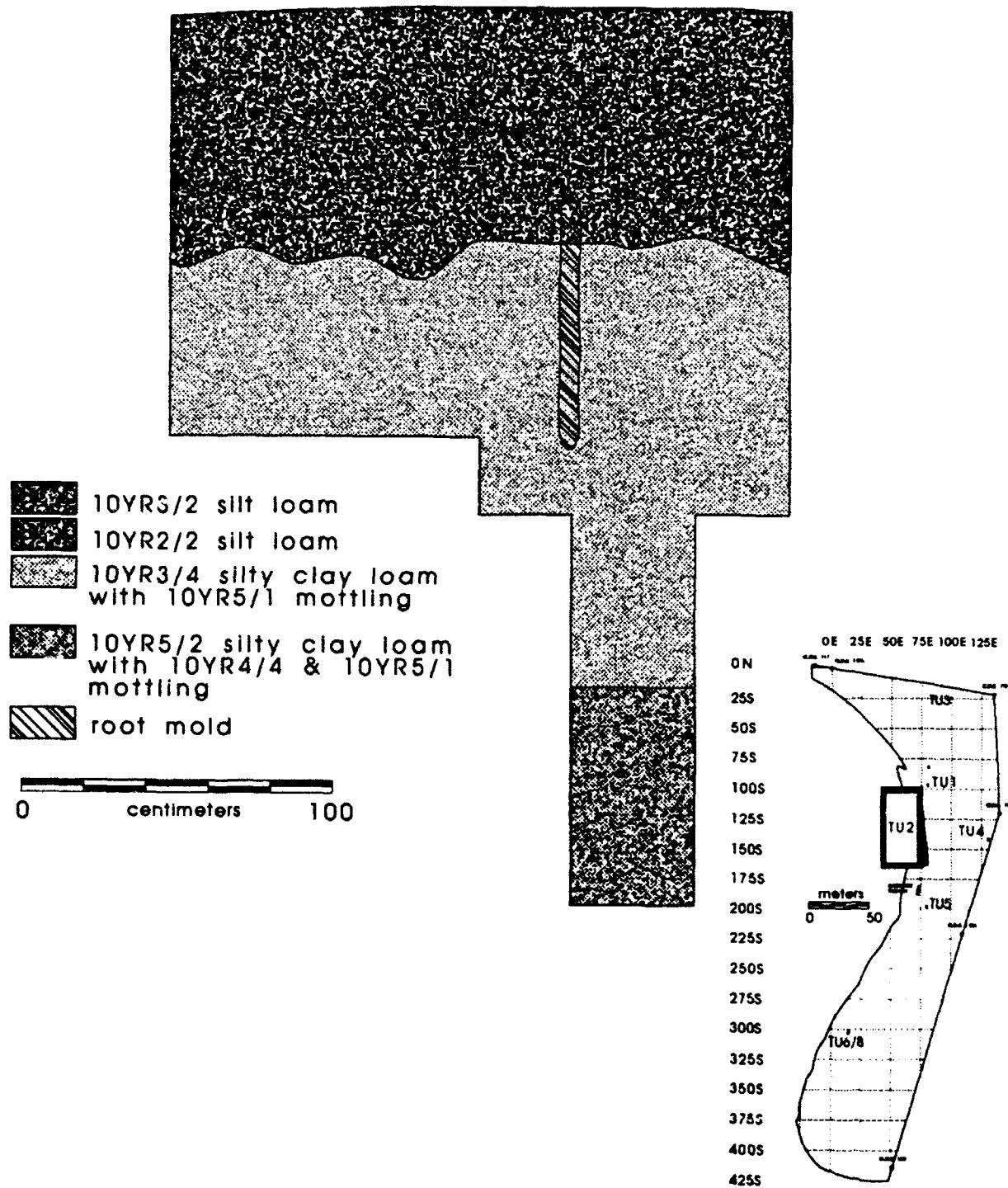


Figure 50. Profile of Test Unit 2 at 23SK1067.

TEST UNIT 3 WEST WALL PROFILE

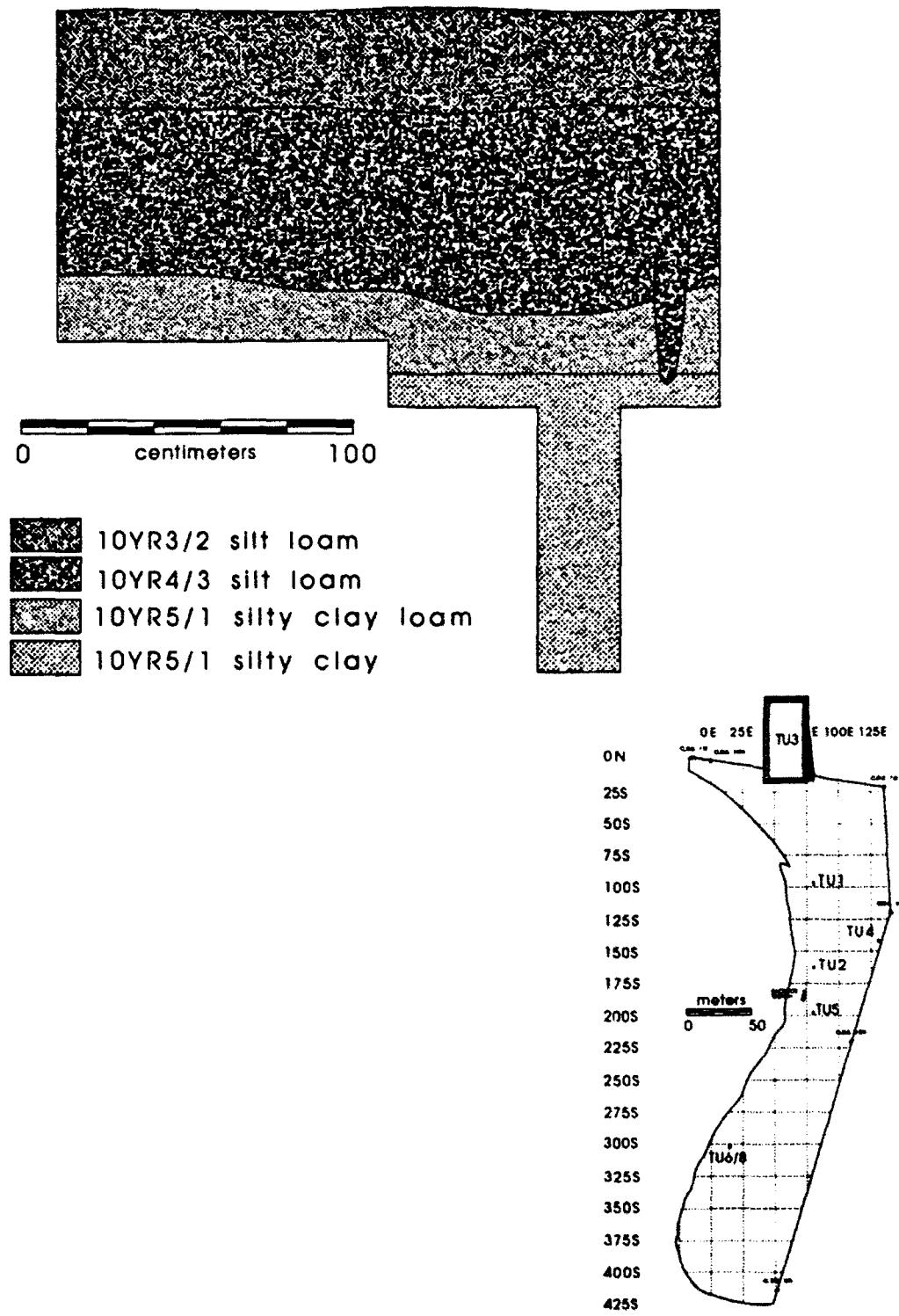


Figure 51. Profile of Test Unit 3 at 23SR1067.

38 pieces of fire-cracked rock, 15 broken flakes, 120 interior flakes, 1 primary decortication flake, 206 retouch flakes, 8 secondary decortication flakes, 1 piece of unidentified ground stone tool, 9 pieces of sandstone, 52 pieces of chert shatter and 3 pieces of unmodified stone. Three hundred forty-three of these were retrieved from level 9 (80 cm - 90 cm). A Smith point (Cat. No. 29-1) was found in the 80 cm - 90 cm level. This point was manufactured from Jefferson City/Cotter undifferentiated Variety 1 chert, weighs 19.1 g and measures 6.4 cm x 3.98 cm x .80 cm. The wide thick blade shows some edge crushing and significant use-polish. This tool was used in butchering activities with a moderate amount of bone contact. A small preform (Cat. No. 29-2) broken from a small dart point or a large arrow point was also found in Level 9. This item is manufactured from Reeds Spring chert Variety 11, weighs 3.4 g, measures 1.88 cm x 2.21 cm x .63 cm and is broken 1.88 cm above the base. The base itself shows some evidence of scraping activities. This artifact cannot be dated. Five strata were encountered in Test Unit 4 (Figure 52). Stratum 1 was a very dark brown (10YR3/2) silt loam that extended to about 43 cm. Stratum 2 was a dark brown (10YR3/3) silt loam containing concretions that extended to 80 cm. Stratum 3 was a brown to dark brown (10YR3/4) silty clay loam that extended to 100 cm. Stratum 4 was a grayish brown (10YR5/2) silty clay loam with strong brown (7.5YR4/6) mottling that extended to 190 cm. Stratum 5 was a gray (10YR5/1) silty clay with strong brown (7.5YR4/6) mottling that extended to the base of the excavation.

Test Unit 5 was placed at 195S/79E. The first 50 cm was removed with a backhoe and the unit then excavated in 10 cm levels to 120 cm where it was stepped down to 1 m x 1 m and further excavated to 180 cm. At that point a posthole test was excavated an additional 120 cm to 300 cm. Thirty-two cultural and non-cultural items were recovered from levels 6 and 7 (50 cm - 70 cm), 9 and 10 (90 cm - 100 cm), and 12 through 16 (110 cm - 160 cm), including 11 pieces of fire-cracked rock, 5 interior flakes, 1 primary decortication flake, 4 retouch flakes, 5 pieces of unmodified sandstone and 6 pieces of chert shatter. Of these, 53% were recovered from levels 15 and 16. Four strata were identified during the excavation of Test Unit 5 (Figure 53). Stratum 1 was a very dark grayish brown (10YR3/2) silt loam that extended to a depth of 40 cm - 45 cm. Stratum 2 was a brown (10YR5/3) silt loam with dark reddish brown (7.5YR3/4) and brown (10YR5/2) mottling that extended to about 70 cm. Stratum 3 was a brown (10YR5/3) silt loam with dark brown (7.5YR3/4), dark yellowish brown (10YR4/4) and gray to light gray (10YR6/1) mottling that extended to 150 cm. Stratum 4 was a brown (10YR4/3) and dark yellowish brown (10YR4/4) silty clay with gray (10YR5/1) mottling that extended to the base of the excavation.

Test Unit 6 was placed at 297.57S/14.76E. The first 40 cm were removed with a backhoe and excavation proceeded in 10 cm levels to 70 cm where it was stepped down to 1 m x 1 m and further excavated to 80 cm. At that point, a posthole test was excavated an additional 120 cm to 200 cm. Twenty-three cultural and non-cultural items were recovered from levels 5 through 8 (40 cm - 80 cm). In addition, 13 items were recovered from the backdirt removed with the backhoe. Materials recovered included 1 core, 28 pieces of fire-cracked rock, 2 interior flakes and 5 pieces of unmodified sandstone. Three strata were identified during the excavation of Test Unit 6 (Figure 54). Stratum 1 was a very dark grayish brown (10YR3/2) silt loam that extended to 33 cm - 48 cm below surface. Stratum 2 was a brown to dark brown (10YR4/3) silt loam that extended as deep as 125 cm. Stratum 3 was a brown to dark brown (10YR4/3) sandy loam that extended to the base of the excavation.

TEST UNIT 4 WEST WALL PROFILE

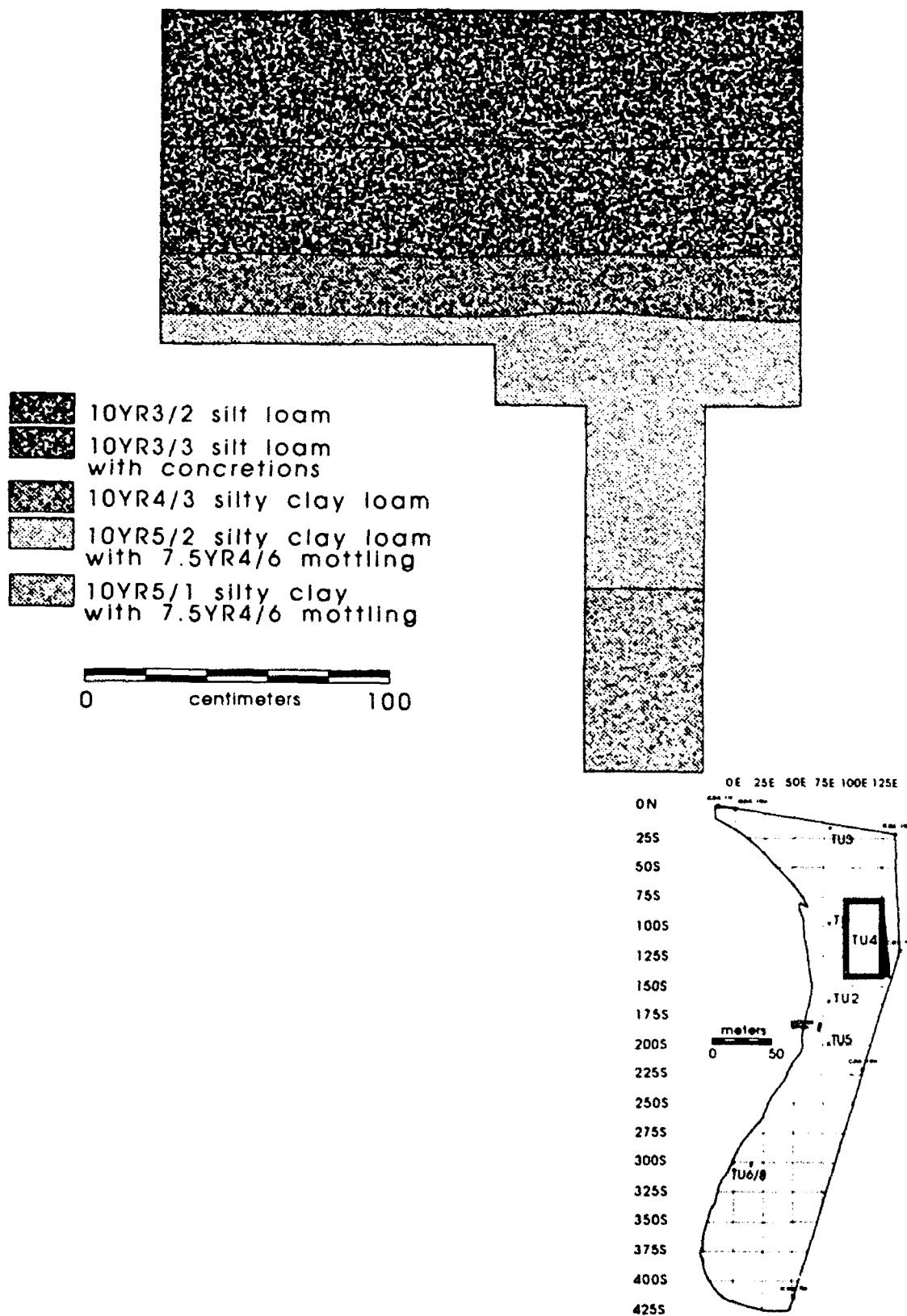


Figure 52. Profile of Test Unit 4 at 23SR1067.

TEST UNIT 5 WEST WALL PROFILE

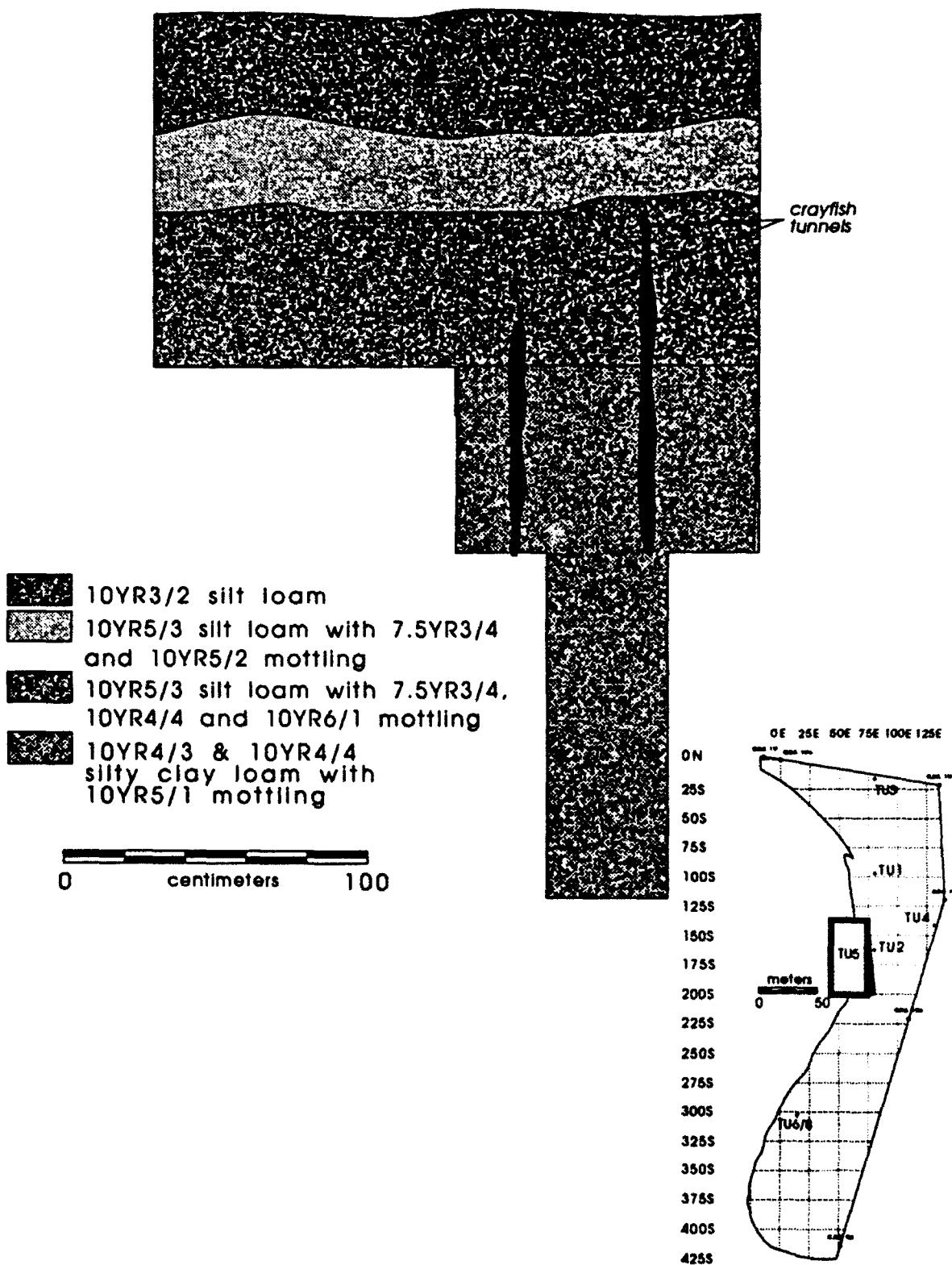


Figure 53. Profile of Test Unit 5 at 23SR1067.

TEST UNIT 6 WEST WALL PROFILE

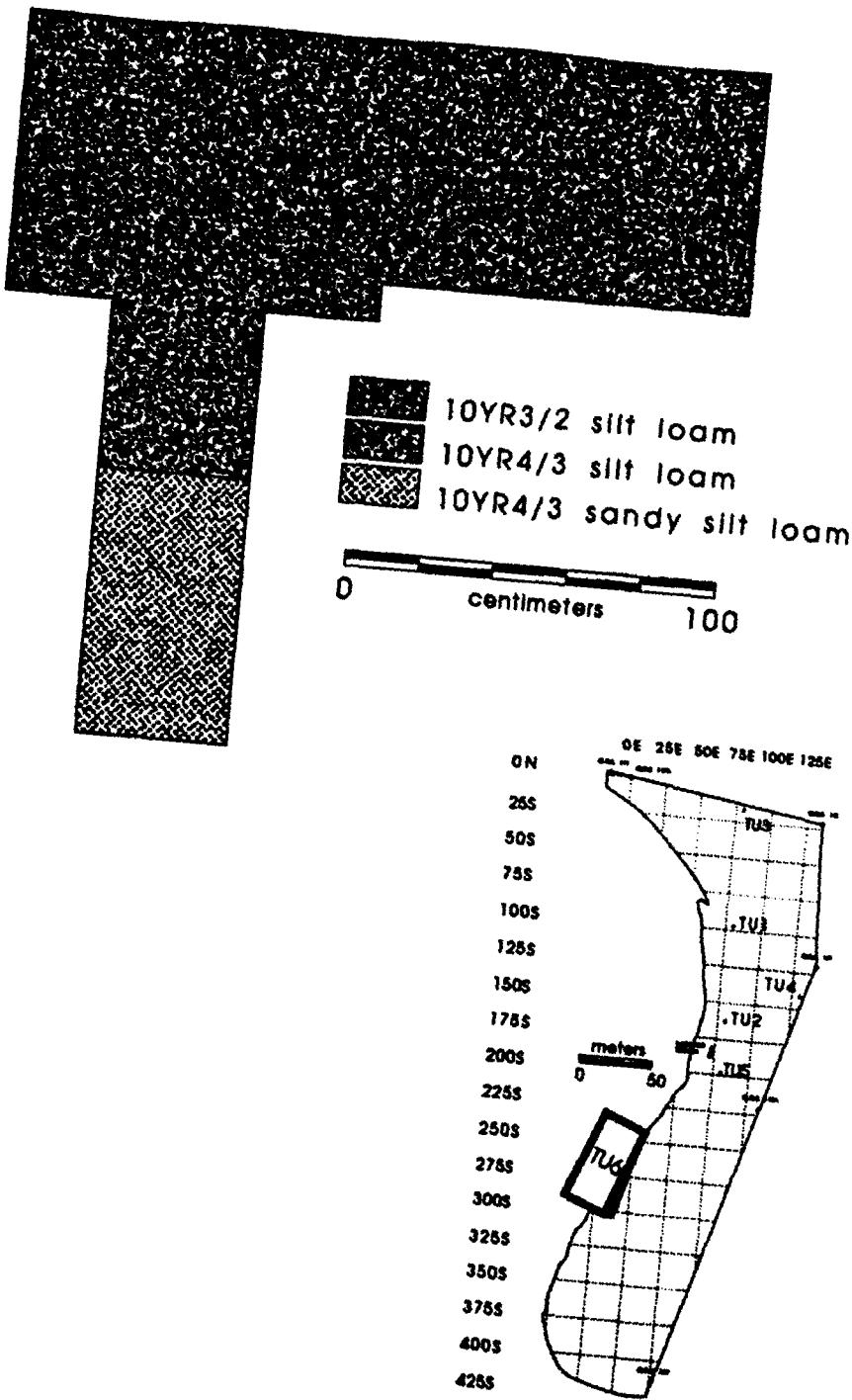


Figure 54. Profile of Test Unit 6 at 23SR1067.

Test Unit 7 was placed 364.67S/8.41E. The first 50 cm were removed with a backhoe and excavation then proceeded in 10 cm levels to 70 cm where it was stepped down to 1 m x 1 m (north half) and further excavated to 90 cm. At that point, a posthole test was excavated an additional 110 cm to 200 cm. No cultural materials were recovered, although one flake was noted in the backdirt removed with the backhoe. Three strata were identified during the excavation of Test Unit 7 (Figure 55). Stratum 1 was a brown to dark brown (10YR4/3) slightly sandy silt loam that extended to a depth of 20 cm. Stratum 2 was a dark yellowish brown (10YR3/4) slightly sandy silt loam that extended to a depth of 142 cm. Stratum 3 was a brown to dark brown (10YR4/3) silty sand that extended to the base of the excavation.

Test Unit 8 was a 1 m x 1 m unit placed 20 cm south of Test Unit 6 to investigate the shallower deposits that had been removed mechanically in Test Unit 6. Excavation proceeded in 10 cm levels to 90 cm. Two hundred thirty-six cultural and non-cultural items were recovered from levels 1 through 7 (0 cm - 70 cm), including 3 unmodified cobbles, 115 pieces of fire-cracked rock, 11 interior flakes, 19 retouch flakes, 1 secondary decortication flake, 1 preform fragment, 1 sand-tempered body sherd, 68 pieces of unmodified sandstone and 17 pieces of chert shatter. One hundred fifty-seven (66%) of these came from levels 1 and 2. An aborted preform (Cat. No. 48-1) was found in Level 2 (10 cm - 20 cm). This artifact is manufactured from Reeds Spring chert, weighs 66.4 g and measures 6.9 cm x 4.38 cm x 2.1 cm. It is likely that reduction of the preform was abandoned because of a fracture encountered during manufacture. This artifact cannot be dated. Two strata were identified during the excavation of Test Unit 8 (Figure 56). Stratum 1 was a very dark grayish brown (10YR3/2) silt loam that ranged in depth from 18 cm to 48 cm. Stratum 2 was a brown to dark brown (10YR4/3) silt loam that extended to the base of the excavation.

Horizontal and Vertical Extent - The surface component at 23SR1067 extends over virtually all of tract 2603E but concentrates near Test Units 6 and 8. The buried component is distributed over an area roughly defined by Test Units 1, 2, 4 and 5, occupying an area approximately 105 m N-S x 70 m E-W (7,350 m²). The deposits extend to an average depth of 110 cm, with the deepest in Test Unit 5 and the shallowest in Test Unit 8.

Cultural Affiliation - 23SR1067 was used during the Late Archaic Period (3000 BC - 1000 BC), as evidenced by the Smith points found in the river and Level 9 of Test Unit 4 and possibly during the Early Woodland Period (1000 BC - 500 BC) as suggested by the Adena-like point found in the river.

Site Function - Activities suggested by the artifacts recovered from the upper component (roughly levels 1 - 7 in the excavations) include cutting/cleaving, food preparation/storage, hunting/butchering, scraping, stone tool manufacture and maintenance, and refuse disposal. Activities suggested for the buried component (roughly levels 8 and below) include food preparation, plant food processing, hunting/butchering stone tool manufacture and maintenance and refuse disposal. No evidence of long-term habitation, such as the remains of structures or storage pits, was recovered. Use as a specialized activity loci, possibly associated with hunting or the exploitation of riverine resources, is indicated.

TEST UNIT 7 WEST WALL PROFILE

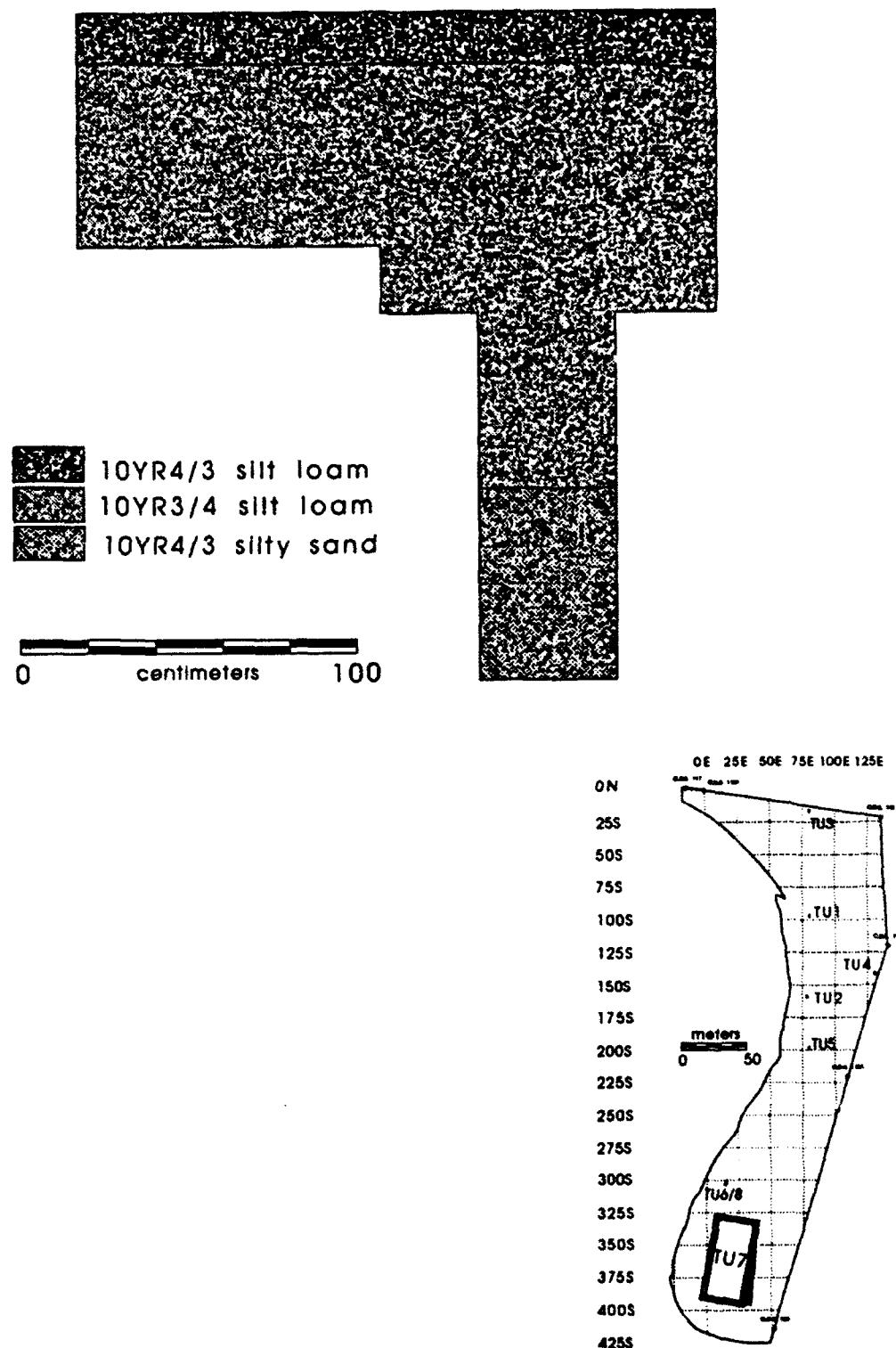


Figure 55. Profile of Test Unit 7 at 23SR1067.

TEST UNIT 8 WEST WALL PROFILE

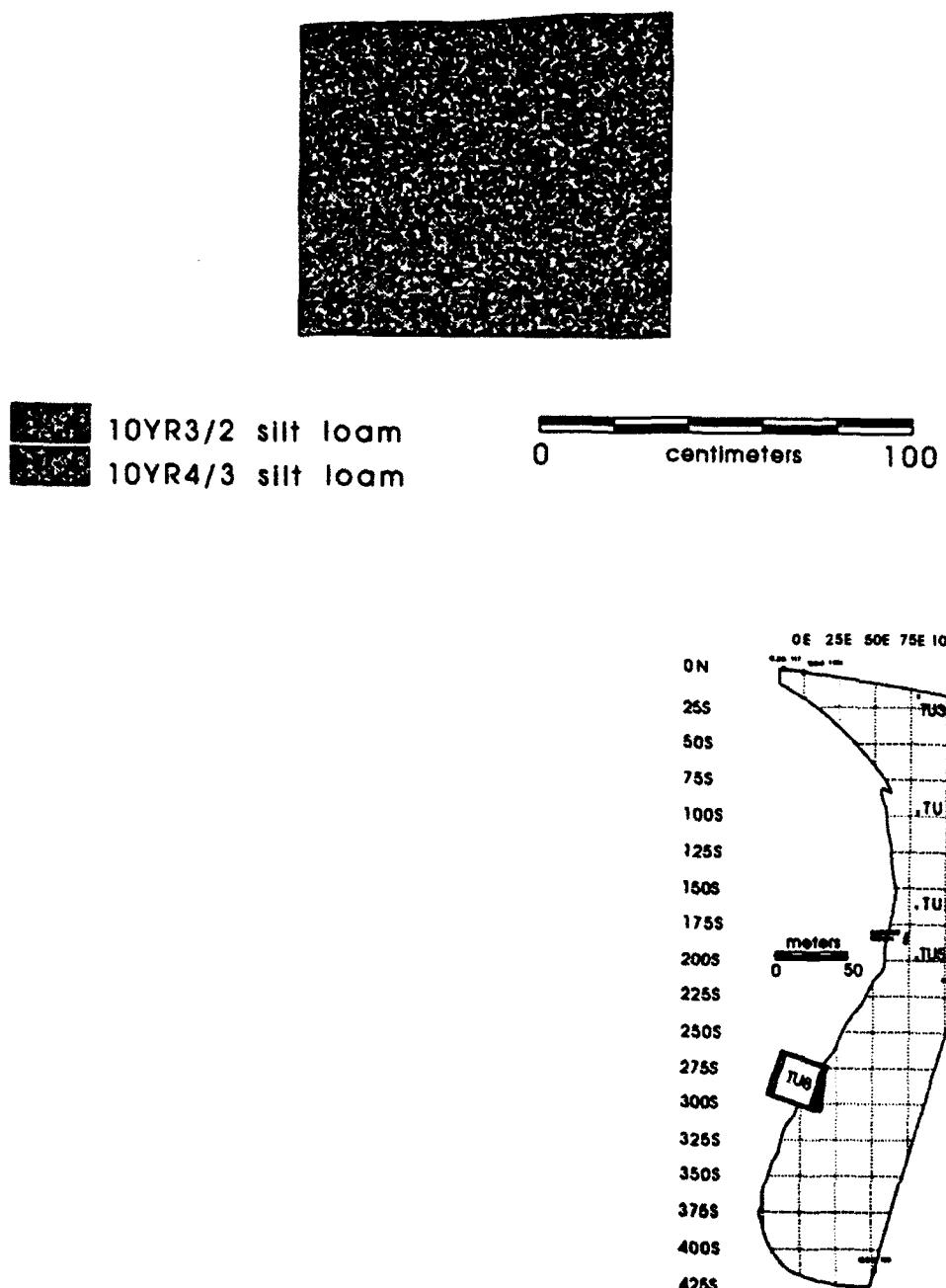


Figure 56. Profile of Test Unit 8 at 23SR1067.

Site Integrity - The site has suffered damage from clearing, cultivating, surface erosion and the excavation of a number of drainage ditches. River migration appears to have eroded away, at most, 10 m of the river bank. In addition, the buried component is extremely well defined and normally contained within 2 levels and, in the case of Test Unit 4, one. We believe that this is an excellent indication that this component is intact.

Significance Assessment - 23SR1067 contains data that makes it eligible for inclusion in the National Register of Historic Places under criterion D. 23SR1067 is likely to yield substantial new information relating to the transition from the Archaic to the Woodland Period in the Sac River Valley. The Early Woodland Period near has been characterized as a continuation of Archaic lifeways because pottery does not appear in the artifact inventory. At 23SR1067 the Late Archaic occupation is buried and stratigraphically distinct from the Woodland occupation so that little mixture of the 2 components has occurred. In addition, the Early Woodland component does not appear to have been seriously contaminated by later occupations, since only one small grit-tempered sherd was recovered. Thus, the site affords the opportunity to study the use of a single location during 2 cultural periods without fear of substantial contamination of the archeological record of either.

SUMMARY OF SIGNIFICANCE ASSESSMENTS

The group of sites tested during this assessment program were discovered (excepting 23SR291) during the ESA survey of COE easements along the banks of the Sac River downstream from Stockton Dam. All had been found from either surface evidence or from artifacts thought to be eroding from various depths along the Sac River cutbank.

This group represents the last of the known Downstream Stockton sites that require assessment in connection with a Memorandum of Agreement (MOA) entered into between the COE, the SHPO and the Advisory Council on Historic Preservation (AHP) pursuant to 3CRF800.6(a). Previous survey and assessment programs determined that of 41 sites, 24 (58%) were found not to be eligible for the National Register while 17 (42%) were considered significant (MOA signed by the District on 13 September 1991).

Our assessment of the remaining sites has concluded that 4 (57%) are not eligible for the National Register and 3 (43%) are significant and therefore should be included in the National Register of Historic Places (Table 17).

23CE439, 23CE444, 23CE446 and 23SR291

For sites without significant deposits we have recommended no further work. These include the 23CE437/23CE438/23CE439 group treated as 23CE439 by the COE, 23CE444, 23CE446 and 23SR291. Any remaining portions of 23CE440 occur outside current COE easements.

Table 17. Management Summary.

Site	Date Range	Probable Site Function	Significant Deposits	Mitigation Efforts
23CE46C	Late to Terminal Archaic 3000 BC - 1000 BC, Late Woodland AD 400-900, Early Mississippi AD 900 - AD 1200	Specialized activity - butchering and other food preparation	Yes - probable undisturbed deposits	Data recovery program and/or major efforts to stop erosion
23CE439	Middle Woodland 500 BC-AD 400, Late Woodland AD 400 - AD 900	Specialized activity - butchering and other food preparation	None	None required
23CE440	NA	NA	NA	None required
23CE442	Late Woodland AD 400 - AD 900	Base settlement	Yes - single component site	Data recovery program and/or major efforts to stop erosion
23CE444	Early Archaic 7000 BC - 5000 BC, Late Woodland AD 400 - AD 900	Specialized activity - butchering and other food preparation	None	None required
23CE446	Paleo-Indian ? 12,000 BC - 8000 BC	Specialized activity - butchering and other food preparation	None	None required
23SR291	Early Archaic 7500 BC - 5000 BC	Unknown prehistoric, historic recreation	None	None required
23SR1067	Unknown prehistoric, modern	Specialized activity - butchering and other food preparation	Yes - well-defined intact deep stratum	Data recovery program and/or major efforts to stop erosion

Each of these sites reflects probable GFH winter-spring or summer-fall specialized activity sites associated with butchering and other food processing activities. The area of 23SR291 tested within the COE easement is hardly a prehistoric site at all and its historic component is composed exclusively of bits of 20th century trash. Archaic and Woodland Period artifacts were found in very small quantities at 23CE439, 23CE444 and 23CE446. Other than these generally datable artifacts, there was no evidence suggesting cultural affiliation of the deposits.

Our assessment in connection with the eligibility of these sites was based on the lack of significant data being present at each site. There was no evidence that structural remains or other features existed. There was similarly no evidence that midden deposits or other discrete artifact concentrations were present in any strata at any depth. No datable contexts had been found and none were considered likely to exist. There was no indication that floral or faunal material or human remains have been preserved. The combination of these characteristics lead us to conclude that significant deposits do not occur at this group of Downstream Stockton sites.

An analysis of the raw materials used for the production of tools at these sites does, however, provide some interesting data in connection with procurement behavior. 23CE439 featured 1 biface fragment made from Jefferson City/Cotter Variety 4 (Table 18). This chert is a dark gray to almost black dolomite that is streaked in places with lighter medium gray. Texture of this chert varies from fine and vitreous in darker areas to coarse in the streaked areas. This variety is known from the Mountain Home, Arkansas area and is probably found in adjacent counties of Missouri as well. All of the other artifacts, including a Scallorn-like arrow point, 2 arrow point tips and 1 Gibson point, were made from Burlington chert that probably came from the Springfield, Missouri area. While the Gibson point is usually considered Middle or Late Woodland, the arrow points are clearly Late Woodland or younger. The whole tool assemblage of 5 specimens probably represents a brief Late Woodland occupation by a hunting group who had gathered chert materials from what is now the Springfield area.

Table 18. Raw material use at Downstream Stockton sites.

Site	Cat. No.	Artifact Description	Heat Treated	Type of chert
23CE46C	8-1	Table Rock variant	No	Jefferson City/Cotter undif. V1
	25-3	Expand-stem hafted biface	Yes	Burlington V2
	43-5	Biface mid-section	Yes	Jefferson City/Cotter undif. V1
	45-3	Preform fragment	Yes	Jefferson City/Cotter undif. V1
	46-3	Preform fragment	Yes	Jefferson City/Cotter undif. V1
	69-4	Biface tip	Yes	Jefferson City/Cotter undif. V1
	70-8	hafted biface stem fragment	No	Burlington V2
	70-9	Scallorn-like arrow point	Yes	Burlington V3
	72-5	Aborted preform	No	Jefferson City/Cotter undif. V1
	75-4	hafted biface	No	Burlington V2
	87-3	Biface tip	No	Burlington
	95-1	Preform fragment	Yes	Pierson
	100-6	hafted biface	Yes	Reeds Spring
	102-1	Preform	Yes	Pierson V1 (highly tripolized)
	109-4	Preform fragment	Yes	Jefferson City/Cotter/Oolitic
	116-3	Biface fragment	Yes	Burlington V1
	123-4	Biface fragment	No	Burlington V1
	132-1	Preform fragment	Yes	Burlington V1
	142-1	Biface fragment	Yes	Burlington V1
	144-4	Unhafted biface base	Yes	Burlington V2
	145-6	Utilized flake	Yes	Jefferson City/Cotter undif. V1
	147-6	Expanding-stem dart point	Yes	Reeds Spring
	148-5	Preform fragment	No	Burlington V2
	149-4	Biface tip	No	Reeds Spring
	151-3	hafted biface mid-section	Yes	Burlington V2
	174-1	Table Rock Pointed Stem	No	Lafayette
	225-5	Biface fragment	No	Jefferson City/Cotter undif. V1
23CE439	1-1	Scallorn-like arrow point	Yes	Burlington
	3-1	Arrow point tip	No	Burlington
	4-1	Unhafted biface fragment	No	Jefferson City/Cotter undif. V4
	5-1	Arrow point tip	Yes	Burlington
	18-3	Gibson point	Yes	Burlington
23CE440	NA	None	NA	NA
23CE442	1-1	Large preform	No	Jefferson City/Cotter undif. V1
	1-3	Preform	Yes	Burlington V1
23CE444	1-1	Dalton point	No	Burlington
	7-1	Serrated uniface	No	Keokuk V1
	9-1	Scallorn-like arrow point	Yes	Burlington V3
	19-1	Biface	Yes	Keokuk V1
	66-5	Scallorn-like arrow point	No	Jefferson City/Cotter undif. V1
	99-3	Crude small arrow point	Yes	Burlington V2
	119-4	hafted biface	Yes	Burlington
23CE446	1-1	Dalton point	No	Burlington V3
	2-1	Broken preform	No	Jefferson City/Cotter undif. V1
	3-2	Preform fragment	No	Jefferson City/Cotter undif. V1
	21-1	Beaver Lake-like point	No	Burlington
23SR291	7-17	Biface tip	No	Reeds Spring
23SR1067	10-1	Beveled unifacial preform	Yes	Reeds Spring
	10-2	Biface tip	No	Jefferson City/Cotter undif. V2
	10-3	Smith point	No	Reeds Spring
	10-4	Expanding-stem dart point	No	Jeff. City/Cotter undif. ozarkite
	10-5	Adena-like point	Yes	Jefferson City/Cotter undif. V1
	29-1	Smith point	No	Jefferson City/Cotter undif. V1
	29-2	Small dart/large arrow point	No	Reeds Spring V1
	48-1	Aborted preform	No	Reeds Spring

23CE444 featured only 1 Scallorn-like arrow point made from Variety 1 of the Jefferson City/Cotter chert. Two artifacts including a serrated uniface and an undiagnostic biface were made from Keokuk Variety 1 chert. This is a very dense and hard white to light gray chert when held to the sunlight. Knappability is fair but improves considerably with heat treatment with one of the bifaces having receiving this pretreatment. Two artifacts including a Dalton point and an undiagnostic hafted biface were made from Burlington Variety 1, a small crude arrow point was made from Burlington Variety 2 and a Scallorn-like arrow point was flaked from Burlington Variety 3, possibly from the Crescent Quarry. Components recognized at 23CE444 include Early Archaic as evidenced by the Dalton point and a post-Middle Woodland occupation as is suggested by the 3 arrow points. The serrated uniface and 2 undiagnostic bifaces could represent any time period or component. The occupants of 23CE444 were apparently traveling regularly to the south and southeast since the Keokuk Variety 1 is found no closer than McDonald and Newton counties and the Burlington probably came from the Springfield, Missouri area, although some can be found in northern Stone County. The site was probably a hunting camp occupied briefly by at least 2 temporally separated groups.

Two broken preforms from 23CE446 were made from the local Jefferson City/Cotter Variety 1 chert. A Dalton point and a Beaver Lake point were made from Burlington chert. The Dalton was manufactured from Variety 3, possibly from the Crescent Quarry, while the Beaver Lake point was produced from Burlington chert Variety 1 (fossiliferous). An Early Archaic occupation is reflected by these artifacts. While some archeologists feel that the Beaver Lake point is of Paleo-Indian affiliation, the specimen here may simply represent a first stage Dalton variant. Both are probably of Early Archaic age, and the site most likely was used as a temporary hunting camp. The Jefferson City/Cotter Variety 1 chert reflects local extraction, while the Burlington Variety 3 suggests travel to the east, as does Burlington Variety 1 to a lesser degree.

Not much can be said about 23SR291 except that someone may have stopped there at least once in prehistoric times. The one biface tip was made from Reeds Spring chert, the nearest outcrops of which are found to the south in the Pierce City and Joplin areas.

23CE46C, 23CE442 and 23SR1067

The 3 sites considered by us to contain significant deposits include 2 in Cedar County (23CE46C and the 23CE441/23CE443 group treated as 23CE442 by the COE) and 1 in St. Clair County (23SR1067).

Of the sites investigated during this project, 23CE46C featured the greatest variety of chert types. Nine (33%) of the 27 tools are made from the Ordovician Jefferson City/Cotter undifferentiated chert. Two varieties are represented. Eight specimens are made from Variety 1, a dense fine-grained dolomite with a mottled or streaked gray or light blue-gray appearance. This variety is widespread throughout northern Arkansas and west-central Missouri and is abundant in the Stockton Reservoir area. The workability of this chert varies from fair to good. One preform fragment was made from an undesignated oolitic variety of Jefferson City/Cotter chert. Oolitic varieties of Jefferson City/Cotter are widespread and difficult to distinguish consistently, but this tool was probably made from a local chert.

Twelve of these tools are made from 3 varieties of Burlington chert. Five are made from Burlington Variety 1, an off white to medium gray medium textured chert with large amounts of crinoid debris included in its matrix. The tripolitic outer cortex is chalky and soft. This variety is usually heat-treated, and 3 of the 5 tools were pretreated in this manner. Six of the tools were manufactured from Burlington Variety 2, an off white to blue-gray chert with darker gray splotches and wisps across the surface. Very few fossils are apparent in this chert, which features a medium to coarse texture. This variety works best after heat treatment, and 3 of the 6 specimens were heat treated. One Scallorn-like arrow point was made from heat treated Burlington Variety 3, a fine grained Burlington chert with moderate amounts of fossil debris enclosed in the matrix. This is similar to the chert found at the well-known Crescent Quarry located near St. Louis, Missouri. Burlington chert is especially abundant in the Springfield, Missouri area some 48 km to 64 km (30 mi to 40 mi) southeast of the Stockton Reservoir sites. It is probable that all 3 varieties came from this general procurement area, although materials from the Crescent Quarry were widely traded.

Three artifacts from 23CE46C were made from Reeds Spring chert. Because of the high quality of some Reeds Spring chert varieties, preforms made from these varieties were widely traded, and artifacts of this chert are often found far from parent formations. Two biface fragments were made from undifferentiated Reeds Spring chert. In both cases the source of the chert apparently was the northern area of the Reeds Spring outcrops. The first undifferentiated Reeds Spring specimen is a distal portion of a biface featuring a combination of light and darker gray with a few small white splotches included. The second probable Reeds Spring undifferentiated specimen is a biface stem and midsection fragment that had been heat treated. The appearance resembles a fine conglomerate with white, gray, pink and blue splotches all over the specimen. Similar Reeds Spring chert comes from the Pierce City, Missouri area. A third specimen was made from Reeds Spring Variety 3. This is a vitreous medium blue and gray chert with swirling slightly darker gray or blue bands and streaks throughout the field. Texture is fine and workability excellent. The source of the Variety 3 example was probably McDonald County, Missouri. A preform and a preform fragment were made from Pierson Variety 1 chert. This is a brick red or reddish brown to light reddish tan chert with abundant white crinoid detritus in most examples. Knappability varies from fair to good. Pierson chert Variety 1 is found in McDonald, Barry, Stone and Taney counties, Missouri. The complete preform was made from a highly tripolized Pierson Variety 1 chert. One contracting stemmed biface was made from what has been called Lafayette chert. This is a highly variable material found as cobbles throughout the Crowley's Ridge area of eastern Missouri and Arkansas.

Based on the lithic materials recovered, it seems apparent that the occupants of 23CE46C were using local chert outcrops or stream cobbles to a great degree since one third of the bifaces and utilized flakes were made from the local Jefferson City/Cotter varieties. It is also apparent that either travel to the south and east was frequent or trade from that direction occurred because 44.4% of the artifacts were made from 3 varieties of Burlington chert. It is highly probable that trips by occupants of 23CE46C were made to the south since the Pierson and Reeds Spring chert are found there. While Reeds Spring chert was traded due to its high quality, Pierson was not since the quality of this chert was only fair to good. The single specimen of Lafayette and the possible Crescent Quarry specimen could mean some travel to the east was done. Components present at 23CE46C include Late Archaic as evidenced by Table Rock-like and expanding

stemmed bifaces. The Table Rock Pointed Stemmed biface and the Scallorn-like arrow point suggest a post Woodland occupation. The site probably represented a temporary hunting camp where bifaces including dart points and butchering tools were refurbished. Evidence supporting this interpretation includes 10 biface fragments and 8 damaged, aborted, or complete preforms. When combined with the probability that undisturbed deposits occur at the site, we have concluded that 23CE46C has the potential to yield important data in connection with how peoples used the Sac River Valley during a 4,000+ year period of the prehistoric past. This is so even though we cannot say with certainty whether the deposits reflected at 23CE46C were the results of GFH winter-spring specialized activities or GFH summer-fall specialized activities.

23CE442 yielded only 2 preforms in its lithic tool assemblage. One of them was made from Jefferson City/Cotter Variety 1. The second preform was made from heat treated Burlington Variety 1 chert. These tools were being manufactured and used in connection with Late Woodland activities based on the associated ceramic artifacts. The Burlington chert probably originated in the Springfield area, while the Jefferson City/Cotter represents a local chert.

Only 23CE442 has evidence suggesting base settlement activities. Although this is primarily based on the presence of pottery in the deposits, we have found in the past that pottery is closely related to more permanent activities as opposed to overnight or other short term procurement tasks. We cannot say, based on the data available from the excavations thus far conducted, whether 23CE442 represents the results of a GFH winter-spring base settlement or a GFH summer-fall base settlement. It probably does not represent AGFH year-round base settlement activities considering the density of the deposits. 23CE442 is important because it represents the results of a single period of use in the prehistoric past. It has the potential to provide important data in connection with how Woodland Period peoples adapted to and used this part of the Sac River Valley more than 1,000 years ago.

23SR1067 yielded a Smith point and an Adena-like biface made from the local Jefferson City/Cotter Variety 1 chert. A biface tip represents a specimen made from Jefferson City/Cotter Variety 2 chert. This dolomite features a mixture of medium gray and dark gray swirls, splotches and irregular bands. Lighter areas are dense while darker areas are coarser in texture. Small crystal filled vugs are visible at 10X and the workability is only fair. This variety is found throughout north central Arkansas and southern Missouri. An expanding stemmed dart point was made from the colorful Jefferson City/Cotter chert known popularly as Mozarkite. It is found in the area of the Harry S. Truman reservoir. Two preforms and a Smith point were made from undifferentiated Reeds Spring chert, probably from the northern most Reeds Spring outcrops. A small dart point or large arrow point was made from Reeds Spring Variety 11 chert. This variety features irregular but large medium to dark gray areas adjacent to irregular gray and white mottled zones. Light splotches are found in the dark areas. Texture is average and workability good. This variety is found in McDonald and Barry counties of southwestern Missouri as well as in northwestern Arkansas. The Smith bifaces represent Late Archaic activities and the Adena-like specimen could reflect the same time period or could be associated with Woodland activities. 23SR1067 probably represents a temporary hunting camp used by peoples who were making occasional trips to the south where they gathered and used Reeds Spring chert. The Jefferson City/Cotter material, with the possible exception of the Mozarkite,

was probably of local origin. The Mozarkite probably was obtained from a source to the northeast in the Harry S. Truman Reservoir area.

Unlike any other site tested during the assessment program, 23SR1067 contains Archaic and Woodland Period deposits in a deep, well-defined and relatively undisturbed stratum. It is not clear whether the deposits represent the results of GFH winter-spring specialized activities or GFH summer-fall specialized activities. The data remaining at 23SR1067 have the potential to make a significant contribution to our understanding of how people used this part of the Sac River Valley during a 4,000+ year period of the prehistoric past.

SUGGESTED RESEARCH QUESTIONS

23CE46C, 23CE442 and 23SR1067 represent the results of Woodland Period activities. Important research issues that remain for the Osage Prairie Study Unit include (Wright 1987):

1. Do Woodland Period activities reflected in the Osage Prairie belong to the Lindley Phase or are other affiliations probable?

- Do the deposits at 23CE46C, 23CE442 and/or 23SR1067 reflect Lindley Phase activities?
- Do the deposits at 23CE46C, 23CE442 and/or 23SR1067 reflect activities of an as yet undefined or unrecognized Woodland Period phase?

2. Subsequent research at 23CE46C, 23CE442 and 23SR1067 should focus on the following:

- What is the settlement-subsistence pattern reflected by the deposits at these sites?
- What is the duration of the so-called Late Woodland adaptations in the Osage Prairie?
- Were the Woodland Period occupants of the Osage Prairie geographically isolated?
- What is the internal structure of the sites?
- What is the evidence of seasonality to suggest summer-fall or winter-spring activities?
- Do the lithic assemblages suggest predominantly local raw material procurement or are materials being exploited from other areas?

Both 23CE46C and 23SR1067 also represent the results of Archaic Period activities. Important research issues that remain for the Osage Prairie Study Unit include (Wright 1987):

1. Do Archaic Period activities reflected in the Osage Prairie belong to the Sedalia Phase or are other affiliations probable?

- Do the deposits at 23CE46C and/or 23SR1067 reflect Sedalia Phase activities?
- Do the deposits at 23CE46C and/or 23SR1067 reflect activities of an as yet undefined or unrecognized Archaic Period phase?

2. Subsequent research at 23CE46C and 23SR1067 should focus on the following:

- What is the settlement-subsistence pattern reflected by the deposits at these sites?
- What is the duration of the Archaic adaptations in the Osage Prairie?
- What is the internal structure of the sites?
- What evidence is there of seasonality to suggest summer-fall or winter-spring activities?
- Do the lithic assemblages suggest predominantly local raw material procurement or are materials being exploited from other areas?

RECOMMENDATIONS

There is no doubt that the behavior of the river is eroding the bank in the easement areas and is thereby impacting the archeological deposits. The deposits contained in 23CE46C, 23CE442 and 23SR1067 should be protected either by a program to prevent further erosion or by a program to recover the important data preserved at these sites.

Mitigation at 23CE46C, 23CE442 and 23SR1067 should be directed toward the recovery of sufficient data to more fully identify the cultural components present along with the recovery of data that would allow addressing the research questions outlined above. The recovery of these data will provide important information in connection with how people have used the Sac River Valley during the prehistoric past.

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GLOSSARY

Unmodified Chippable Stone. This is a raw material category and includes fragments of chert suitable for the manufacture of flaked stone tools that exhibit no evidence of modification. Specimens from which flakes have been removed are classified as cores or tested cobbles.

Tested Cobble. This is another raw material category that includes whole or nearly whole chert or quartzite cobbles that have no more than two flakes removed and that exhibit no further intentional modification. These are normally composed of poor grades of raw material.

Core. This is also a raw material category that includes cobbles or tabular pieces of good quality chert or quartzite from which more than two flakes have been removed and which show no modification for other uses. Cores recycled for use as hammerstones, choppers, etc. are classified under those categories.

Shatter. This category includes angular fragments of chert or quartzite resulting from various reduction processes. Some shatter may be confused with cobble fragments and fire-cracked rock, however, most of the latter are readily recognized.

Primary Decortication Flake. This category includes unmodified flakes in which ninety percent or more of the dorsal surface is covered with cortex. These are by-products of the initial stage of core preparation, core reduction and biface manufacture and are most likely to be found at quarry sites, workshop sites and base settlements. Specimens exhibiting use wear or intentional modification are classified as modified flakes.

Secondary Decortication Flake. This category includes unmodified flakes in which cortex covers less than ninety percent of the dorsal surface and that exhibit clear evidence of the removal of previous flakes. These are by-products of various stages of core preparation and biface manufacture and usually occur at quarry sites, workshop sites and base settlements. Flakes exhibiting cortex only on the striking platform are classified as interior flakes. Those exhibiting use wear or intentional modification are classified as modified flakes.

Preform. This category includes unstemmed bifacial artifacts and fragments thereof that do not appear to represent finished bifacial tools. Distinguishing characteristics include generally crude flaking (usually percussion) and a lack of use wear. Many occur as fragments that were broken during manufacture and discarded. These items represent the final stage of initial biface reduction, before being worked into finished tools.

Interior Flake. These flakes are normally produced during the latter stages of bifacial reduction. Distinguishing characteristics include a lack of cortex, steep platform angles, deep flake scars on the dorsal surface and a thick cross section. They may intergrade with some retouch flakes and may also be confused with decortication flakes struck from raw materials lacking cortex. Specimens exhibiting use wear or intentional modification are classified as modified flakes.

Retouch Flake. These flakes are produced during the final stages of bifacial reduction and tool sharpening or modification. Distinguishing characteristics include acute platform angles, shallow and wide scars on the dorsal surface and a thin cross section. Some specimens may be difficult to distinguish from interior flakes. Those exhibiting use wear or intentional modification are classified as modified flakes.

Broken Flake. These are incomplete flakes that cannot be assigned to any other flake category with confidence. Most are small, thin fragments that are probably fragments of retouch flakes but lack a striking platform or other distinguishing attributes.

Biface. These are complete or fragmentary, unstemmed bifacial tools. Tip and midsection fragments of projectile points are normally included in this category but stemmed fragments are included in the projectile point category. Arrow point fragments are not included.

Dart Point. Any relatively large, symmetrical, bifacially worked artifact that has been modified for hafting, or any fragment that shows evidence of a hafting element is classified as a dart point. Tip and midsection fragments are normally assigned to the biface category.

Arrow Point. This category includes small, thin, symmetrical, pointed bifaces or any fragment thereof. A hafting element is often present but may be unobtrusive in some specimens.

Drill/Reamer. These specimens exhibit rotating wear on a pointed tip. We have classified long, thin, bifacially worked specimens as drills. These are probably reworked projectile points. Reamers include tools with a similar function that are made of fragments of chert or flakes that are not bifacially worked or modified for hafting.

Modified Flake. These are flakes that exhibit use wear or intentional modification for use as cutting or scraping tools. Working edges may be concave, straight or convex. Specimens exhibiting unifacial wear (shear chipping) are classified as flake scrapers while those exhibiting bifacial wear (wear chipping) are classified as flake knives.

Hammerstone. These are generally large chunks of chert or other hard stone that exhibit well defined zones of battering on prominent corners or edges. Some are rounded in appearance.

Flat Abrader. These are characterized by the presence of a flat or slightly convex areas on the face of a cobble on which the patination has been worn away and/or a greater degree of smoothness is present than is typical of the natural cobble surface. In the case of sandstone or quartzite close inspection will show that individual grains on the abraded surface are worn.

Edge-Ground Cobble. These tools are characterized by the presence of a well defined ground or abraded facet, shallow groove or wide indentation on the edge of a cobble. Some weathered cobbles may be mistaken for edge-ground cobbles but individual grains should be worn and there should be a difference in the amount of patination when compared with the remainder of the cobble.

Grinding Basin. These tools exhibit a shallow, smooth basin on the face of a cobble or slab of stone. These are usually made of a coarse grained stone and used for plant food processing.

Pitted Cobble. These cobbles have one or more pits that are U or V-shaped in cross section. Those with V-shaped pits may have been used in bipolar flaking as hard anvils while U-shaped pits may have resulted from nut cracking.

APPENDIX A. PROJECT PARTICIPANTS

SAMUEL B. ADDINGTON, LOREN HUDSON, RON PENDERGRAPH and CARL E. REEVES of rural Cedar County, Missouri assisted in the field work.

CHRIS BOGERT, MARCIA CLARK, ROBERT E. ESTES and KIMBERLY D. WALKER of Stockton, Missouri assisted in the field work.

DON R. DICKSON participated in the analysis of the lithic assemblage and authored various sections of the report. Mr. Dickson received a B.S. in secondary education from the University of Arkansas in 1967. He is a recognized regional expert in the study of lithic use and procurement.

JOHN L. GRAY, IV assisted in the field investigations. Mr. Gray received a B.A. in anthropology from the University of Arkansas in 1991.

STEVEN M. IMHOFF directed the field work and wrote various portions of the report. Mr. Imhoff has 17 years experience as a professional archeologist and has conducted investigations in Arkansas, Louisiana, Missouri and Oklahoma. He received a B.S. in sociology from the University of Tulsa in 1974 and an M.A. in anthropology from the University of Arkansas in 1982. He is a member of the Society of Professional Archeologists.

TIMOTHY C. KLINGER served as principal investigator and authored various sections of the report. Mr. Klinger received an M.A. in anthropology from the University of Arkansas in 1977 and a J.D. from the University of Arkansas School of Law in 1982. He is a member of the Society of Professional Archeologists and is an attorney at law licensed by the State of Arkansas.

ERNEST W. McFEETERS assisted in the field work. Mr. McFeeters received a B.A. in anthropology from Kansas State University in 1991 and has participated in archeological investigations in Arkansas, Kansas and Missouri.

JAMES W. SMITH assisted in the field work. Mr. Smith received a B.A. from Arkansas State University in 1975 and has over 10 years experience in archeology. He is currently pursuing a Master's degree in anthropology at the University of Arkansas.

APPENDIX B. PIECE PLOTTED ARTIFACTS NOT COLLECTED

Piece Plot and Artifact	Grid Location		
	23CE439		
PP 002 - FLAKE	122.03/22.16	PP 066 - FLAKE	207.98/4.76
PP 003 - FLAKE	100.41/29.09	PP 067 - FLAKE	208.59/2.94
PP 004 - FLAKE	104.21/59.19	PP 068 - FLAKE	209.66/-0.10
PP 005 - FLAKE	104.45/61.05	PP 069 - FLAKE	207.82/-0.24
PP 006 - FLAKE	130.16/24.70	PP 070 - FLAKE	205.81/-0.60
PP 007 - SHATTER	139.03/21.79	PP 071 - FLAKE	205.35/1.25
PP 008 - SANDSTONE	141.08/11.68	PP 072 - FLAKE	208.44/-1.40
PP 009 - SANDSTONE	151.01/13.62	PP 073 - BURNED SANDSTONE	209.93/-3.16
PP 010 - SANDSTONE	152.99/38.44	PP 074 - FLAKE	210.17/-2.84
PP 011 - FLAKE	159.64/12.79	PP 075 - SHATTER	211.30/-0.60
PP 012 - SHATTER	160.72/13.61	PP 076 - FLAKE	211.49/-0.73
PP 013 - FLAKE	161.69/5.38	PP 077 - FLAKE	215.25/-2.40
PP 014 - SHATTER	166.31/8.51	PP 078 - FLAKE	215.07/-2.04
PP 015 - SHATTER	168.01/10.06	PP 079 - FLAKE	214.93/-1.88
PP 016 - SANDSTONE	169.25/11.15	PP 080 - FLAKE	218.27/-2.39
PP 017 - SANDSTONE & FLAKE	167.93/12.21	PP 081 - BURNED SANDSTONE	219.19/-2.40
PP 018 - POOR QUALITY CHERT	172.01/12.40	PP 082 - FLAKE	219.71/-2.62
PP 019 - SHATTER	172.51/12.12	PP 083 - SANDSTONE (2)	220.35/-2.17
PP 020 - SHATTER	172.63/12.04	PP 084 - SANDSTONE	220.41/-1.71
PP 021 - SANDSTONE	171.18/10.00	PP 085 - SANDSTONE	220.59/-1.54
PP 022 - BURNED SS & SHATTER	172.24/10.01	PP 086 - BURNED SANDSTONE	220.74/-2.37
PP 023 - LIMESTONE	173.07/9.52	PP 087 - FLAKE	221.41/-2.96
PP 024 - BURNED SANDSTONE	171.42/4.74	PP 088 - FLAKE & SHATTER	222.09/-0.60
PP 025 - FLAKE	172.89/3.00	PP 089 - BURNED SANDSTONE	223.72/-3.08
PP 026 - LIMESTONE	177.13/10.67	PP 090 - BURNED SANDSTONE	221.68/1.50
PP 027 - SHATTER	178.62/12.99	PP 091 - BURNED SANDSTONE	221.08/1.87
PP 028 - FLAKE	180.06/12.50	PP 092 - BURNED SANDSTONE	221.43/2.13
PP 029 - SHATTER	177.09/14.77	PP 093 - BURNED SANDSTONE	221.35/1.88
PP 030 - FLAKE	174.40/13.14	PP 094 - FLAKE	220.90/2.75
PP 031 - SS ROAD GRAVEL	173.70/19.59	PP 095 - BURNED SANDSTONE	220.35/1.36
PP 032 - SANDSTONE & SHATTER	173.75/13.27	PP 096 - FLAKE	220.06/1.49
PP 033 - SHATTER	188.32/25.24	PP 097 - FLAKE	219.50/1.33
PP 034 - PEBBLE	188.54/19.00	PP 098 - FLAKE	218.13/-0.01
PP 035 - SANDSTONE	190.61/17.55	PP 099 - FLAKE	215.95/1.41
PP 036 - FLAKE	194.81/20.37	PP 100 - BURNED SANDSTONE	217.12/2.90
PP 037 - FLAKE	194.84/14.15	PP 101 - BURNED SANDSTONE	218.29/2.52
PP 038 - SANDSTONE	189.24/12.71	PP 102 - FLAKE	219.17/2.88
PP 039 - BURNED SANDSTONE	188.90/12.50	PP 103 - FLAKE	216.60/5.41
PP 040 - FLAKE	186.36/8.73	PP 104 - SHATTER	211.08/2.16
PP 043 - SHATTER	182.71/0.05	PP 105 - FLAKE	210.16/3.01
PP 045 - FLAKE	191.02/-0.08	PP 106 - BURNED SANDSTONE	210.74/3.60
PP 046 - SANDSTONE & FLAKE	192.49/1.46	PP 107 - FLAKE	213.66/6.08
PP 047 - SANDSTONE	192.78/1.67	PP 108 - FLAKE	213.23/6.89
PP 049 - FLAKE	195.34/-0.48	PP 109 - SANDSTONE ABRADER?	211.30/6.77
PP 050 - CHERT COBBLE	197.58/-4.58	PP 110 - FLAKE	215.26/-5.01
PP 051 - BURNED SANDSTONE	190.63/-6.49	PP 111 - FLAKE	
PP 052 - BURNED SANDSTONE	191.08/-5.80	PP 112 - FLAKE	211.25/-9.42
PP 053 - BURNED SANDSTONE	190.28/-6.26		
PP 054 - SANDSTONE	188.87/-8.93		
PP 056 - FLAKE	198.80/0.94		
PP 057 - SHATTER	201.51/1.66		
PP 058 - FLAKE	198.64/3.96		
PP 059 - FLAKE	198.31/12.59		
PP 060 - FLAKE	204.47/10.17		
PP 061 - FLAKE	205.56/8.25		
PP 062 - SANDSTONE	205.13/4.85		
PP 063 - FLAKE	205.18/3.81		
PP 064 - FLAKE	206.41/3.83		
PP 065 - SANDSTONE	206.17/4.05		
	23CE444		
		PP 001 - INTERIOR FLAKE	-7.19/113.85
		PP 002 - PRIMARY DECORT FLAKE	-36.78/136.76
		PP 003 - INTERIOR FLAKE	-51.39/149.71
		PP 004 - SANDSTONE	-57.57/135.24
		PP 005 - SANDSTONE	-45.28/121.21
		PP 006 - PRIMARY DECORT FLAKE	-51.70/115.58
		PP 007 - SANDSTONE	-51.74/111.47
		PP 009 - CHERT COBBLE FRAG	-49.95/97.78
		PP 010 - SANDSTONE	-39.97/98.51
		PP 011 - INTERIOR FLAKE	-38.44/97.85
		PP 012 - SANDSTONE	-38.88/96.99
		PP 013 - SANDSTONE	-34.18/93.30
		PP 014 - SANDSTONE	-43.34/103.74

PP 015 - SANDSTONE	-44.65/105.61	PP 087 - INTERIOR FLAKE	-1.65/63.81
PP 017 - SANDSTONE	-40.19/108.12	PP 088 - INTERIOR FLAKE	-2.31/64.47
PP 018 - SANDSTONE	-40.85/114.95	PP 089 - SANDSTONE	-2.25/64.88
PP 019 - SANDSTONE	-29.28/123.43	PP 090 - SANDSTONE	-7.10/67.18
PP 020 - INTERIOR FLAKE	-22.85/121.97	PP 091 - SHATTER	-7.91/66.60
PP 021 - INTERIOR FLAKE	-26.57/115.97	PP 092 - SANDSTONE	-9.57/67.93
PP 022 - SHATTER	-24.99/114.72	PP 093 - SANDSTONE	-10.78/67.85
PP 023 - SANDSTONE	-19.29/112.53	PP 094 - RETOUCH FLAKE	-10.71/67.50
PP 024 - SANDSTONE	-16.54/109.34	PP 095 - SANDSTONE	-12.58/69.48
PP 025 - SECOND DECORT FLAKE	2.60/92.86	PP 096 - INTERIOR FLAKE	-12.89/64.66
PP 026 - SANDSTONE	0.37/96.22	PP 097 - SANDSTONE	-12.13/63.19
PP 027 - SECOND DECORT FLAKE	3.64/86.27	PP 098 - SANDSTONE	-11.19/63.84
PP 028 - INTERIOR FLAKE	1.38/86.87	PP 099 - INTERIOR FLAKE	-11.64/65.11
PP 029 - PRIMARY DECORT FLAKE	-1.34/87.87	PP 100 - INTERIOR FLAKE & SS	-9.80/64.94
PP 030 - SANDSTONE	-1.02/88.14	PP 101 - SANDSTONE	-9.03/63.31
PP 031 - SANDSTONE	-0.04/86.50	PP 102 - RETOUCH FLAKE	-6.47/62.52
PP 032 - SANDSTONE	-3.13/89.87	PP 104 - SANDSTONE	-8.53/58.55
PP 033 - SECOND DECORT FLAKE	4.62/89.69	PP 105 - INTERIOR FLAKE	-7.67/56.18
PP 034 - SANDSTONE	-5.02/88.23	PP 106 - SANDSTONE	-12.19/56.19
PP 035 - SANDSTONE	-8.08/86.42	PP 107 - LOW QUALITY CHERT	-13.46/54.21
PP 038 - SANDSTONE	-26.20/86.02	PP 108 - SHATTER	-15.65/52.29
PP 040 - SANDSTONE	-23.79/81.08	PP 109 - SANDSTONE	-17.70/52.78
PP 041 - PRIMARY DECORT FLAKE	-21.69/83.10	PP 110 - SS & RIVER GRAVEL	-18.92/50.50
PP 042 - SANDSTONE	-20.12/85.33	PP 112 - SS & RIVER GRAVEL	-16.27/47.72
PP 043 - SANDSTONE	-20.15/86.07	PP 113 - SANDSTONE	-14.91/45.42
PP 045 - SECOND DECORT FLAKE	-15.42/84.17	PP 114 - SANDSTONE (2)	-14.30/45.58
PP 046 - LOW QUALITY CHERT	-13.50/79.56	PP 115 - SANDSTONE	-13.32/51.76
PP 047 - SANDSTONE	-13.21/77.03	PP 116 - SANDSTONE	-11.66/50.50
PP 048 - SANDSTONE	-13.13/76.41	PP 117 - INTERIOR FLAKE	-12.18/50.48
PP 049 - SECOND DECORT FLAKE	-11.00/82.23	PP 118 - SANDSTONE	-6.15/49.88
PP 050 - RIVER GRAVEL	-9.89/81.93	PP 119 - SANDSTONE	-4.91/48.62
PP 051 - SANDSTONE	-9.25/80.04	PP 120 - LOW QUALITY CHERT	-4.31/47.76
PP 052 - SANDSTONE	-11.82/72.43	PP 121 - SANDSTONE	-7.18/44.62
PP 053 - SANDSTONE	-11.08/71.91	PP 122 - SANDSTONE	-4.20/42.87
PP 054 - SANDSTONE	-9.15/74.17	PP 124 - SANDSTONE	0.03/42.51
PP 055 - SANDSTONE	-8.71/69.21	PP 125 - SANDSTONE	-24.52/49.63
PP 056 - SANDSTONE	-8.01/73.17	PP 126 - SANDSTONE	-20.83/51.10
PP 057 - INTERIOR FLAKE	-7.11/77.18	PP 127 - SANDSTONE	-22.53/52.79
PP 058 - SANDSTONE	-6.62/77.04	PP 128 - SANDSTONE	-23.64/53.29
PP 059 - SANDSTONE	-6.40/76.87	PP 129 - SANDSTONE	-27.44/51.80
PP 060 - INTERIOR FLAKE	-6.41/72.23	PP 130 - SANDSTONE	-27.39/52.26
PP 061 - RETOUCH FLAKE	-4.14/71.50	PP 131 - SANDSTONE	-23.95/53.16
PP 062 - SHATTER	-3.30/70.08	PP 132 - SANDSTONE	-23.18/54.89
PP 064 - SANDSTONE	-3.50/67.19	PP 133 - SHATTER	-23.84/53.18
PP 065 - SANDSTONE	-3.10/67.25	PP 134 - SANDSTONE (2)	-22.06/54.37
PP 066 - SHATTER	4.30/72.84	PP 135 - SANDSTONE	-21.68/54.25
PP 067 - RETOUCH FLAKE	3.27/78.45	PP 136 - SANDSTONE	-19.69/53.49
PP 068 - SANDSTONE	2.66/77.66	PP 137 - SHATTER	-19.07/53.52
PP 069 - SHATTER	-0.36/75.70	PP 138 - SANDSTONE	-18.68/56.65
PP 070 - SHATTER	-0.75/75.81	PP 139 - LOW QUALITY CHERT	-19.02/58.92
PP 071 - SANDSTONE	-1.50/77.03	PP 140 - SANDSTONE	-15.41/59.34
PP 072 - SANDSTONE	-5.09/76.55	PP 141 - RETOUCH FLAKE	-15.60/59.62
PP 073 - SANDSTONE	-1.82/80.08	PP 142 - SANDSTONE	-15.94/61.56
PP 074 - SECOND DECORT FLAKE	1.06/82.03	PP 143 - SANDSTONE	-18.51/60.92
PP 075 - SECOND DECORT FLAKE	1.19/81.94	PP 144 - SANDSTONE	-20.91/60.56
PP 076 - SANDSTONE	0.78/82.72	PP 145 - SANDSTONE	-20.61/60.77
PP 078 - SANDSTONE	0.64/64.02	PP 146 - SHATTER	-20.52/60.97
PP 079 - SANDSTONE	2.95/62.31	PP 147 - INTERIOR FLAKE	-22.63/61.20
PP 080 - SHATTER	2.95/62.20	PP 148 - SANDSTONE	-24.16/61.81
PP 081 - SHATTER	3.95/62.21	PP 149 - SANDSTONE	-565.25/4.78
PP 082 - PRIMARY DECORT FLAKE	2.50/59.66	PP 150 - INTERIOR FLAKE	-25.16/61.76
PP 083 - INTERIOR FLAKE	0.96/58.03	PP 151 - SANDSTONE	-25.91/62.33
PP 084 - SANDSTONE	-0.52/58.62	PP 152 - SANDSTONE	-26.20/62.22
PP 085 - INTERIOR FLAKE	-0.49/53.04	PP 153 - SANDSTONE	-28.20/57.06
PP 086 - SANDSTONE	-2.33/53.60	PP 154 - SHATTER	

PP 155 - INTERIOR FLAKE	-19.21/65.02	PP 223 - SHATTER W/CORTEX	-46.80/78.63
PP 156 - SANDSTONE	-19.36/73.79	PP 224 - INTERIOR FLAKE	-45.78/78.01
PP 157 - SANDSTONE	-16.90/66.32	PP 226 - SANDSTONE	-45.01/78.85
PP 158 - SANDSTONE (2)	-17.23/66.97	PP 227 - SANDSTONE	-43.33/81.80
PP 159 - SANDSTONE	-15.88/69.79	PP 228 - SANDSTONE	-42.22/82.17
PP 160 - CHERT COBBLE	-16.09/72.68	PP 229 - SANDSTONE	-41.91/82.49
PP 161 - SHATTER	-19.00/73.96	PP 230 - SANDSTONE	-41.58/81.19
PP 162 - LOW QUALITY CHERT	-19.15/70.53	PP 231 - SHATTER	-39.74/81.03
PP 163 - SANDSTONE	-21.08/67.98	PP 232 - SANDSTONE	-40.13/79.89
PP 164 - SANDSTONE	-21.55/67.80	PP 234 - PRIMARY DECORT FLAKE	-40.37/79.45
PP 165 - SHATTER	-55.32/94.90	PP 235 - SANDSTONE	-43.24/76.36
PP 166 - SANDSTONE	-57.96/87.16	PP 236 - SHATTER	-42.22/76.01
PP 167 - SHATTER W/CORTEX	-63.36/86.75	PP 237 - INTERIOR FLAKE	-43.03/75.61
PP 168 - SANDSTONE	-63.84/86.39	PP 238 - INTERIOR FLAKE	-44.03/76.13
PP 169 - SANDSTONE	-61.73/84.10	PP 239 - SHATTER	-44.73/73.19
PP 170 - SHATTER & SANDSTONE	-64.03/87.19	PP 240 - SANDSTONE	-46.52/71.59
PP 171 - SANDSTONE	-70.97/85.22	PP 241 - RETOUCH FLAKE	-46.78/71.35
PP 172 - INTERIOR FLAKE	-72.20/85.49	PP 242 - COBBLE	-48.12/73.37
PP 173 - LOW QUALITY CHERT	-67.69/79.19	PP 243 - SANDSTONE	-47.89/71.51
PP 174 - SANDSTONE	-66.16/73.56	PP 244 - SHATTER	-42.66/71.69
PP 175 - SANDSTONE	-63.79/72.78	PP 245 - SHATTER	-21.11/69.77
PP 176 - PRIMARY DECORT FLAKE	-63.32/79.36	PP 246 - INTERIOR FLAKE	-21.81/68.69
PP 177 - SANDSTONE	-58.78/109.22	PP 247 - SHATTER	-22.05/67.75
PP 178 - MISC. LITHIC (FOSSIL)	-47.27/89.37	PP 248 - RETOUCH FLAKE	-21.37/66.24
PP 179 - SANDSTONE	-48.36/86.35	PP 249 - PRIMARY DECORT FLAKE	-23.45/66.76
PP 180 - INTERIOR FLAKE	-50.28/84.70	PP 250 - RETOUCH FLAKE	-24.06/67.12
PP 181 - SANDSTONE	-53.34/83.06	PP 251 - SANDSTONE	-24.47/67.12
PP 182 - SANDSTONF.	-56.54/82.57	PP 252 - SANDSTONE	-24.64/64.72
PP 183 - SS & RIVER GRAVEL	-55.19/81.17	PP 253 - SANDSTONE	-24.91/64.57
PP 184 - SANDSTONE	-54.42/81.96	PP 257 - SHATTER	-27.37/64.13
PP 185 - SANDSTONE	-53.42/79.71	PP 258 - SHATTER	-25.57/70.00
PP 186 - SANDSTONE	-54.96/76.57	PP 259 - INTERIOR FLAKE	-25.97/69.93
PP 187 - SANDSTONE	-57.17/75.30	PP 260 - SANDSTONE	-25.81/69.25
PP 188 - SANDSTONE	-57.56/77.10	PP 261 - SANDSTONE	-26.42/69.72
PP 189 - RETOUCH FLAKE	-58.05/76.21	PP 262 - SANDSTONE	-26.19/69.94
PP 190 - INTERIOR FLAKE & SS	-63.83/84.35	PP 263 - RETOUCH FLAKE	-26.54/69.20
PP 191 - INTERIOR FLAKE	-58.38/75.48	PP 264 - INTERIOR FLAKE	-27.23/69.05
PP 192 - SANDSTONE	-59.00/75.13	PP 265 - INTERIOR FLAKE	-27.77/77.03
PP 193 - RETOUCH FLAKE	-58.74/72.31	PP 266 - INTERIOR FLAKE	-27.85/76.96
PP 194 - SECOND DECORT FLAKE	-58.43/72.40	PP 267 - SANDSTONE	-28.49/76.32
PP 195 - SANDSTONE	-57.67/71.71	PP 268 - SECOND DECORT FLAKE	-28.67/77.83
PP 196 - INTERIOR FLAKE	-60.35/68.35	PP 269 - SANDSTONE	-30.88/71.86
PP 197 - SHATTER	-58.81/67.24	PP 270 - SANDSTONE	-31.62/71.90
PP 198 - SANDSTONE	-55.35/69.27	PP 271 - SANDSTONE	-32.44/71.88
PP 200 - SANDSTONE	-53.22/67.00	PP 272 - SANDSTONE	-30.98/69.13
PP 202 - SHATTER W/CORTEX	-50.15/66.40	PP 273 - SANDSTONE	-31.17/69.29
PP 203 - SHATTER W/CORTEX	-48.08/63.51	PP 274 - SANDSTONE	-32.71/66.85
PP 205 - SANDSTONE	-48.05/65.78	PP 275 - SANDSTONE	-32.49/68.81
PP 206 - PRIMARY DECORT FLAKE	-45.70/65.78	PP 276 - SANDSTONE	-32.66/68.93
PP 207 - SANDSTONE	-45.97/65.96	PP 277 - SANDSTONE	-33.04/69.21
PP 208 - SANDSTONE	-46.60/66.79	PP 278 - SHATTER	-36.49/69.11
PP 209 - SANDSTONE	-44.83/68.68	PP 279 - SANDSTONE	-34.80/74.05
PP 210 - SANDSTONE	-43.86/69.49	PP 280 - SHATTER W/CORTEX	-36.14/76.57
PP 211 - RETOUCH FLAKE	-44.29/68.69	PP 281 - SANDSTONE	-37.54/76.91
PP 212 - SHATTER	-44.64/68.79	PP 282 - INTERIOR FLAKE	-38.84/76.72
PP 213 - INTERIOR FLAKE	-44.69/69.75	PP 283 - INTERIOR FLAKE	-40.45/73.58
PP 214 - SANDSTONE	-47.46/67.90	PP 284 - SHATTER	-39.96/69.02
PP 215 - SANDSTONE	-52.39/71.35	PP 286 - INTERIOR FLAKE	-32.97/47.71
PP 216 - SECOND DECORT FLAKE	-52.23/71.49	PP 288 - SANDSTONE (2)	-37.01/57.14
PP 217 - SHATTER	-53.35/70.16	PP 289 - SECOND DECORT FLAKE	-38.29/57.39
PP 218 - SANDSTONE	-52.69/72.72	PP 290 - SHATTER	-38.29/57.38
PP 219 - SANDSTONE	-51.51/72.81	PP 291 - SHATTER	-38.32/57.72
PP 220 - SHATTER	-51.57/73.01	PP 292 - SANDSTONE	-41.69/58.81
PP 221 - INTERIOR FLAKE	-48.30/66.51	PP 293 - INTERIOR FLAKE	-41.82/60.59
PP 222 - SANDSTONE	-46.96/77.23	PP 294 - SANDSTONE	-42.26/60.98

PP 295 - SANDSTONE	-35.13/66.17	PP 307 - COBBLE	-108.22/213.47
PP 296 - SANDSTONE	-45.43/62.04	PP 308 - SANDSTONE	-124.37/219.16
PP 298 - SHATTER	-81.71/151.95	PP 310 - SANDSTONE	-154.52/252.51
PP 299 - SANDSTONE	-114.06/182.21	PP 312 - RETOUCH FLAKE	-154.04/236.38
PP 300 - SANDSTONE	-126.59/179.84	PP 313 - SHATTER	-154.87/236.78
PP 301 - SANDSTONE	-136.34/179.90	PP 314 - SANDSTONE	-173.42/234.87
PP 302 - INTERIOR FLAKE	-138.76/180.74	PP 315 - INTERIOR FLAKE	-177.22/217.76
PP 303 - INTERIOR FLAKE	-146.93/183.08	PP 316 - SHATTER	-176.08/216.56
PP 304 - SECOND DECORT FLAKE	-156.62/183.91	PP 317 - SANDSTONE	-156.37/213.25
PP 305 - SANDSTONE	-150.32/194.51	PP 318 - SHATTER	-161.03/210.45
PP 306 - SANDSTONE	-144.97/194.04		

APPENDIX C

Annals Received

APPENDIX C
Annexa Recurrent

Contract No.: DACW41-90-C-0032
Project: Downstream Structures Testing

Line Name	Grid Location	Depth (m)	Aspect Description		Cl.	Wt.
			E	S		
Surface unit 1D0	Surface unit 1D0	0.00-45.00	Surface	Fabre, rough	1	0.2
Surface unit 1D0	Surface unit 1D0	0.00-45.00	Surface	Sandstone	1	44.4
Surface unit 1D0	Surface unit 1D0	0.00-40.00	Surface	Fabre, smooth	1	2.3
Surface unit 1D0	Surface unit 1D0	0.00-40.00	Surface	Fabre, broken	1	29.3
Surface unit 1D0	Surface unit 1D0	0.00-35.00	Surface	Sandstone	1	1.9
Surface unit 1D0	Surface unit 1D0	0.00-35.00	Surface	Fabre, smooth	1	3.3
Surface unit 1D0	Surface unit 1D0	0.00-30.00	Surface	Fir-cracked rock	1	4.5
Surface unit 1D0	Surface unit 1D0	0.00-30.00	Surface	Sandstone	1	3.3
Surface unit 1D0	Surface unit 1D0	0.00-25.00	Surface	Sandstone	1	1.4
Surface unit 1D0	Surface unit 1D0	0.00-25.00	Surface	Fabre, smooth	1	0.4
Surface unit 1D0	Surface unit 1D0	0.00-20.00	Surface	Sandstone	1	2.3
Surface unit 1D0	Surface unit 1D0	0.00-20.00	Surface	Fabre, smooth	1	0.7
Surface unit 1D0	Surface unit 1D0	0.00-15.00	Surface	Sandstone	1	7.9
Surface unit 1D0	Surface unit 1D0	0.00-15.00	Surface	Fabre, smooth	1	1.6
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Sandstone	1	0.1
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Data point summary (Table Rock)	1	4.9
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Fabre, smooth	1	2.5
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Sandstone	1	0.2
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Fir-cracked chrt	1	7.4
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Shale	1	1.0
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Sandstone	1	1.5
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Fabre, smooth	1	0.7
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Shale	1	0.3
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Sandstone	1	21.0
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Fabre, broken	1	99.4
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Shale	1	0.4
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Fir-cracked rock	1	4.9
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Shale	1	0.4
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Fabre, smooth	1	4.1
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Fir-cracked chrt	1	1.0
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Shale	1	0.4
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Fabre, smooth	1	1.6
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Sandstone	1	2.5
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Fabre, smooth	1	1.2
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Shale	1	1.9
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Fir-cracked rock	1	9.4
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Shale	1	31.9
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Fabre, smooth	1	10.3
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Fir-cracked chrt	1	1.6
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Shale	1	68.1
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Shale	1	3.0
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Shale	1	71.6
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Sandstone	1	17.3
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Fabre, smooth	1	6.5
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Fabre, broken	1	5.3
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Shale	1	45.3
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Fir-cracked rock	1	10.3
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Shale	1	13.6
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Shale	1	10.4
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Cherty stone, unclassified	1	49.3
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Fabre, smooth	1	7.6
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Shale	1	2.4
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Data point average	1	1.8
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Fir-cracked rock	1	22.8
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Sandstone	1	13.6
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Fabre, smooth	1	46.2
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Fabre, smooth	1	0.2
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Shale	1	10.0
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Fir-cracked rock	1	27.9
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Sandstone	1	12.0
Surface unit 1D0	Surface unit 1D0	0.00-10.00	Surface	Cherty stone, unclassified	1	22.0

Project: Denavit-Hartenberg Structure Testing

APPENDIX C Artifacts Recovered

APPENDIX C

Deutsche Schriftten Tradition

Project: Documentation Specification Testing

Col #	Unit Name	Grid Location	Depth (cm)	Affiliate Description	Cl.	Wt.
1	67.4	Surface unit 067	-10.00/05.00	2.2CEMC	Coal	0.4
2	68.1	Surface unit 068	-10.00/10.00	Surface	Flake, primary decoration	0.8
3	68.2	Surface unit 068	-10.00/10.00	Surface	Flake, retouch	0.7
4	68.3	Surface unit 068	-10.00/10.00	Surface	Shatter	5.5
5	68.4	Surface unit 068	-10.00/10.00	Surface	Sandstone	24.0
6	69.1	Surface unit 069	-10.00/15.00	Surface	Flake, broken	4.4
7	69.2	Surface unit 069	-10.00/15.00	Surface	Flake, broken	3.5
8	69.3	Surface unit 069	-10.00/15.00	Surface	Shatter	51.3
9	69.4	Surface unit 069	-10.00/15.00	Surface	Biface fragments	2.3
10	69.5	Surface unit 069	-10.00/15.00	Surface	Sandstone	34.3
11	69.6	Surface unit 069	-10.00/15.00	Surface	Muscle shell	0.2
12	70.1	Surface unit 070	-10.00/20.00	Surface	Chippable stone, unmodified	158.4
13	70.2	Surface unit 070	-10.00/20.00	Surface	Flake, surface	5.6
14	70.3	Surface unit 070	-10.00/20.00	Surface	Flake, retouch	2.7
15	70.4	Surface unit 070	-10.00/20.00	Surface	Flake, broken	0.3
16	70.5	Surface unit 070	-10.00/25.00	Surface	Sandstone	11.7
17	70.6	Surface unit 070	-10.00/25.00	Surface	Quartz	2.1
18	70.7	Surface unit 070	-10.00/25.00	Surface	Flake, primary decoration	979.4
19	70.8	Surface unit 070	-10.00/25.00	Surface	Arrow point, unmodified	1.7
20	71.1	Surface unit 071	-10.00/25.00	Surface	Flake, surface	2.0
21	71.2	Surface unit 071	-10.00/25.00	Surface	Flake, retouch	0.2
22	71.3	Surface unit 071	-10.00/25.00	Surface	Flake, broken	1.4
23	71.4	Surface unit 071	-10.00/25.00	Surface	Sandstone	4.2
24	71.5	Surface unit 071	-10.00/25.00	Surface	Flake, primary decoration	3.5
25	72.1	Surface unit 072	-10.00/35.00	Surface	Flake, retouch	14.3
26	72.2	Surface unit 072	-10.00/35.00	Surface	Flake, broken	0.7
27	72.3	Surface unit 072	-10.00/35.00	Surface	Flake, retouch	0.7
28	72.4	Surface unit 072	-10.00/35.00	Surface	Shatter	161.6
29	72.5	Surface unit 072	-10.00/35.00	Surface	Pearl	2.1
30	72.6	Surface unit 072	-10.00/35.00	Surface	Sandstone	36.4
31	72.7	Surface unit 072	-10.00/35.00	Surface	Chippable stone, unmodified	297.7
32	72.8	Surface unit 072	-10.00/35.00	Surface	Flake, primary decoration	162.5
33	72.9	Surface unit 072	-10.00/35.00	Surface	Flake, surface	13.2
34	73.1	Surface unit 073	-10.00/40.00	Surface	Flake, primary decoration	9.8
35	73.2	Surface unit 073	-10.00/40.00	Surface	Flake, surface	9.8
36	73.3	Surface unit 073	-10.00/40.00	Surface	Sandstone	2.4
37	73.4	Surface unit 073	-10.00/40.00	Surface	Flake, broken	1.6
38	73.5	Surface unit 073	-10.00/40.00	Surface	Shatter	9.4
39	73.6	Surface unit 073	-10.00/40.00	Surface	Data mine, limestone	4.9
40	73.7	Surface unit 073	-10.00/40.00	Surface	Sandstone	124.8
41	73.8	Surface unit 073	-10.00/40.00	Surface	Flake, broken	12.0
42	73.9	Surface unit 073	-10.00/40.00	Surface	Flake, retouch	0.6
43	74.1	Surface unit 073	-10.00/40.00	Surface	Shatter	45.2
44	74.2	Surface unit 073	-10.00/40.00	Surface	Sandstone	27.0
45	74.3	Surface unit 073	-10.00/40.00	Surface	Flake, surface	21.9
46	74.4	Surface unit 073	-10.00/40.00	Surface	Flake, broken	2.6
47	74.5	Surface unit 073	-10.00/40.00	Surface	Shatter	6.7
48	74.6	Surface unit 073	-10.00/40.00	Surface	Data mine, limestone	0.2
49	74.7	Surface unit 073	-10.00/40.00	Surface	Sandstone	94.4
50	74.8	Surface unit 073	-10.00/40.00	Surface	Chippable stone, unmodified	265.8
51	74.9	Surface unit 073	-10.00/40.00	Surface	Shatter	28.0
52	75.1	Surface unit 073	-10.00/40.00	Surface	Sandstone	76.0
53	75.2	Surface unit 073	-10.00/40.00	Surface	Chippable stone, unmodified	26.4
54	75.3	Surface unit 073	-10.00/40.00	Surface	Shatter	13.3
55	75.4	Surface unit 073	-10.00/40.00	Surface	Sandstone	90.0
56	75.5	Surface unit 073	-10.00/40.00	Surface	Flake, retouch	0.2
57	75.6	Surface unit 073	-10.00/40.00	Surface	Shatter	13.2
58	75.7	Surface unit 073	-10.00/40.00	Surface	Sandstone	2.6
59	75.8	Surface unit 073	-10.00/40.00	Surface	Flake, broken	2.6
60	75.9	Surface unit 073	-10.00/40.00	Surface	Sandstone	2.6
61	76.1	Surface unit 074	-10.00/45.00	Surface	Flake, broken	2.6
62	76.2	Surface unit 074	-10.00/45.00	Surface	Sandstone	2.6
63	76.3	Surface unit 074	-10.00/45.00	Surface	Flake, broken	2.6
64	76.4	Surface unit 074	-10.00/45.00	Surface	Sandstone	2.6
65	76.5	Surface unit 074	-10.00/45.00	Surface	Flake, broken	2.6
66	76.6	Surface unit 074	-10.00/45.00	Surface	Sandstone	2.6
67	76.7	Surface unit 074	-10.00/45.00	Surface	Flake, broken	2.6
68	76.8	Surface unit 074	-10.00/45.00	Surface	Sandstone	2.6
69	76.9	Surface unit 074	-10.00/45.00	Surface	Flake, broken	2.6
70	77.1	Surface unit 074	-10.00/45.00	Surface	Sandstone	2.6
71	77.2	Surface unit 074	-10.00/45.00	Surface	Flake, broken	2.6
72	77.3	Surface unit 074	-10.00/45.00	Surface	Sandstone	2.6
73	77.4	Surface unit 074	-10.00/45.00	Surface	Flake, broken	2.6
74	77.5	Surface unit 074	-10.00/45.00	Surface	Sandstone	2.6
75	77.6	Surface unit 074	-10.00/45.00	Surface	Flake, broken	2.6
76	77.7	Surface unit 074	-10.00/45.00	Surface	Sandstone	2.6
77	77.8	Surface unit 074	-10.00/45.00	Surface	Flake, broken	2.6
78	77.9	Surface unit 074	-10.00/45.00	Surface	Sandstone	2.6
79	78.1	Surface unit 074	-10.00/45.00	Surface	Flake, broken	2.6
80	78.2	Surface unit 074	-10.00/45.00	Surface	Sandstone	2.6
81	78.3	Surface unit 074	-10.00/45.00	Surface	Flake, broken	2.6
82	78.4	Surface unit 074	-10.00/45.00	Surface	Sandstone	2.6
83	78.5	Surface unit 074	-10.00/45.00	Surface	Flake, broken	2.6
84	78.6	Surface unit 074	-10.00/45.00	Surface	Sandstone	2.6
85	78.7	Surface unit 074	-10.00/45.00	Surface	Flake, broken	2.6
86	78.8	Surface unit 074	-10.00/45.00	Surface	Sandstone	2.6
87	78.9	Surface unit 074	-10.00/45.00	Surface	Flake, broken	2.6
88	79.1	Surface unit 074	-10.00/45.00	Surface	Sandstone	2.6
89	79.2	Surface unit 074	-10.00/45.00	Surface	Flake, broken	2.6
90	79.3	Surface unit 074	-10.00/45.00	Surface	Sandstone	2.6
91	80.1	Surface unit 080	-10.00/50.00	Surface	Flake, broken	2.6
92	80.2	Surface unit 080	-10.00/50.00	Surface	Sandstone	2.6
93	80.3	Surface unit 080	-10.00/50.00	Surface	Flake, broken	2.6
94	80.4	Surface unit 080	-10.00/50.00	Surface	Sandstone	2.6
95	80.5	Surface unit 080	-10.00/50.00	Surface	Flake, broken	2.6
96	80.6	Surface unit 080	-10.00/50.00	Surface	Sandstone	2.6
97	80.7	Surface unit 080	-10.00/50.00	Surface	Flake, broken	2.6
98	80.8	Surface unit 080	-10.00/50.00	Surface	Sandstone	2.6
99	80.9	Surface unit 080	-10.00/50.00	Surface	Flake, broken	2.6
100	81.1	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
101	81.2	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
102	81.3	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
103	81.4	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
104	81.5	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
105	81.6	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
106	81.7	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
107	81.8	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
108	81.9	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
109	82.1	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
110	82.2	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
111	82.3	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
112	82.4	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
113	82.5	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
114	82.6	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
115	82.7	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
116	82.8	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
117	82.9	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
118	83.1	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
119	83.2	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
120	83.3	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
121	83.4	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
122	83.5	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
123	83.6	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
124	83.7	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
125	83.8	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
126	83.9	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
127	84.1	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
128	84.2	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
129	84.3	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
130	84.4	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
131	84.5	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
132	84.6	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
133	84.7	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
134	84.8	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
135	84.9	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
136	85.1	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
137	85.2	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
138	85.3	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
139	85.4	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
140	85.5	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
141	85.6	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
142	85.7	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
143	85.8	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
144	85.9	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
145	86.1	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
146	86.2	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
147	86.3	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
148	86.4	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
149	86.5	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
150	86.6	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
151	86.7	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
152	86.8	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
153	86.9	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
154	87.1	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
155	87.2	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
156	87.3	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
157	87.4	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
158	87.5	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
159	87.6	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
160	87.7	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
161	87.8	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
162	87.9	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
163	88.1	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
164	88.2	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
165	88.3	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
166	88.4	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
167	88.5	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
168	88.6	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
169	88.7	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
170	88.8	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
171	88.9	Surface unit 081	-10.00/50.00	Surface	Flake, broken	2.6
172	89.1	Surface unit 081	-10.00/50.00	Surface	Sandstone	2.6
173	89.2	Surface unit 081	-10.00/50.00	Surface	Flake, broken</	

APPENDIX C

APPLIED

Dowmunt Shetland Terrier

Project Requirements Specification

Project Streamline Structure Testing

Contract No.: DATW1801-001-C-0003

Col #	Unit Name	Grid Location	Depth (cm)	Artifact Description	Ct.	Wt.
				11C-EWAC		
101-1	Surface unit 101		-15.00±5.00	Surface	1	10.0
101-2	Surface unit 101		-15.00±5.00	Surface	2	4.7
101-3	Surface unit 101		-15.00±5.00	Shatter	2	2.7
101-4	Surface unit 101		-15.00±5.00	Shatter, primary deconcretion	1	2.6
102-1	Surface unit 102		-15.00±5.00	Surface	10	173.0
102-2	Surface unit 102		-15.00±5.00	Surface	10	113.3
102-3	Surface unit 102		-15.00±5.00	Surface	10	6.4
102-4	Surface unit 102		-15.00±5.00	Shatter	2	0.6
103-1	Surface unit 103		-15.00±5.00	Surface	2	8.8
103-2	Surface unit 103		-15.00±5.00	Shatter	2	2.1
103-3	Surface unit 103		-15.00±5.00	Shatter, broken	3	50.0
103-4	Surface unit 103		-15.00±5.00	Shatter, broken	2	12.5
104-1	Surface unit 104		-15.00±5.00	Surface	10	160.0
104-2	Surface unit 104		-15.00±5.00	Surface	3	170.0
104-3	Surface unit 104		-15.00±5.00	Shatter	3	6.2
104-4	Surface unit 104		-15.00±5.00	Shatter, primary deconcretion	2	2.7
105-1	Surface unit 105		-15.00±5.00	Surface	10	120.0
105-2	Surface unit 105		-15.00±5.00	Surface	10	100.0
105-3	Surface unit 105		-15.00±5.00	Shatter	2	1.5
105-4	Surface unit 105		-15.00±5.00	Shatter, broken	2	1.5
106-1	Surface unit 106		-15.00±5.00	Surface	10	100.0
106-2	Surface unit 106		-15.00±5.00	Surface	10	80.0
106-3	Surface unit 106		-15.00±5.00	Shatter	2	2.7
106-4	Surface unit 106		-15.00±5.00	Shatter, broken	2	1.5
107-1	Surface unit 107		-20.00±4.00	Surface	10	100.0
107-2	Surface unit 107		-20.00±4.00	Surface	10	80.0
107-3	Surface unit 107		-20.00±4.00	Shatter	2	2.7
107-4	Surface unit 107		-20.00±4.00	Shatter, primary deconcretion	2	1.5
108-1	Surface unit 108		-20.00±4.00	Surface	10	100.0
108-2	Surface unit 108		-20.00±4.00	Surface	10	80.0
108-3	Surface unit 108		-20.00±4.00	Shatter	2	2.7
108-4	Surface unit 108		-20.00±4.00	Shatter, broken	2	1.5
109-1	Surface unit 109		-20.00±4.00	Surface	10	100.0
109-2	Surface unit 109		-20.00±4.00	Surface	10	80.0
109-3	Surface unit 109		-20.00±4.00	Shatter	2	2.7
109-4	Surface unit 109		-20.00±4.00	Shatter, primary deconcretion	2	1.5
110-1	Surface unit 110		-20.00±4.00	Surface	10	100.0
110-2	Surface unit 110		-20.00±4.00	Surface	10	80.0
110-3	Surface unit 110		-20.00±4.00	Shatter	2	2.7
110-4	Surface unit 110		-20.00±4.00	Shatter, broken	2	1.5
110-5	Surface unit 110		-20.00±4.00	Shatter, primary deconcretion	1	0.4
111-1	Surface unit 111		-20.00±3.00	Surface	10	100.0
111-2	Surface unit 111		-20.00±3.00	Surface	10	80.0
111-3	Surface unit 111		-20.00±3.00	Shatter	2	2.7
111-4	Surface unit 111		-20.00±3.00	Shatter, broken	2	1.5
111-5	Surface unit 111		-20.00±3.00	Shatter, primary deconcretion	1	0.4
112-1	Surface unit 112		-20.00±2.00	Surface	10	100.0
112-2	Surface unit 112		-20.00±2.00	Surface	10	80.0
112-3	Surface unit 112		-20.00±2.00	Shatter	2	2.7
112-4	Surface unit 112		-20.00±2.00	Shatter, broken	2	1.5
112-5	Surface unit 112		-20.00±2.00	Shatter, primary deconcretion	1	0.4
113-1	Surface unit 113		-20.00±1.50	Surface	10	100.0
113-2	Surface unit 113		-20.00±1.50	Surface	10	80.0
113-3	Surface unit 113		-20.00±1.50	Shatter	2	2.7
113-4	Surface unit 113		-20.00±1.50	Shatter, broken	2	1.5
113-5	Surface unit 113		-20.00±1.50	Shatter, primary deconcretion	1	0.4
114-1	Surface unit 114		-20.00±1.00	Surface	10	100.0
114-2	Surface unit 114		-20.00±1.00	Surface	10	80.0
114-3	Surface unit 114		-20.00±1.00	Shatter	2	2.7
114-4	Surface unit 114		-20.00±1.00	Shatter, broken	2	1.5
114-5	Surface unit 114		-20.00±1.00	Shatter, primary deconcretion	1	0.4
115-1	Surface unit 115		-20.00±0.50	Surface	10	100.0
115-2	Surface unit 115		-20.00±0.50	Surface	10	80.0
115-3	Surface unit 115		-20.00±0.50	Shatter	2	2.7
115-4	Surface unit 115		-20.00±0.50	Shatter, broken	2	1.5
115-5	Surface unit 115		-20.00±0.50	Shatter, primary deconcretion	1	0.4
116-1	Surface unit 116		-20.00±0.00	Surface	10	100.0
116-2	Surface unit 116		-20.00±0.00	Surface	10	80.0
116-3	Surface unit 116		-20.00±0.00	Shatter	2	2.7
116-4	Surface unit 116		-20.00±0.00	Shatter, broken	2	1.5
116-5	Surface unit 116		-20.00±0.00	Shatter, primary deconcretion	1	0.4
117-1	Surface unit 117		-20.00±0.00	Surface	10	100.0
117-2	Surface unit 117		-20.00±0.00	Surface	10	80.0
117-3	Surface unit 117		-20.00±0.00	Shatter	2	2.7
117-4	Surface unit 117		-20.00±0.00	Shatter, broken	2	1.5
117-5	Surface unit 117		-20.00±0.00	Shatter, primary deconcretion	1	0.4
118-1	Surface unit 118		-20.00±0.00	Surface	10	100.0
118-2	Surface unit 118		-20.00±0.00	Surface	10	80.0
118-3	Surface unit 118		-20.00±0.00	Shatter	2	2.7
118-4	Surface unit 118		-20.00±0.00	Shatter, broken	2	1.5
118-5	Surface unit 118		-20.00±0.00	Shatter, primary deconcretion	1	0.4
119-1	Surface unit 119		-20.00±0.00	Surface	10	100.0
119-2	Surface unit 119		-20.00±0.00	Surface	10	80.0
119-3	Surface unit 119		-20.00±0.00	Shatter	2	2.7
119-4	Surface unit 119		-20.00±0.00	Shatter, broken	2	1.5
119-5	Surface unit 119		-20.00±0.00	Shatter, primary deconcretion	1	0.4

APPENDIX C

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APPENDIX C
Anisotropy Received

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APPENDIX C

Project: Downstream Section Testing						Contract No.: D/CW/NI 90/C-002
Site Code	Site Name	Grid Location	Depth (cm)	Anisitic Description	C.L.	WL.
101-1	Surface unit 101-1	35.000.00	Surfice	Plate, smooth	0.3	0.3
102-2	Surface unit 102-2	35.000.00	Surfice	Fire-cracked chert	1.3	1.3
103-3	Surface unit 103-3	35.000.00	Surfice	Sandstone	1.3	1.3
104-4	Surface unit 104-4	35.000.00	Surfice	Cone	2.4	2.4
105-5	Surface unit 105-5	35.000.00	Surfice	Plate, smooth	0.3	0.3
106-6	Surface unit 106-6	35.000.00	Surfice	Plate, broken	1.9	1.9
107-7	Surface unit 107-7	35.000.00	Surfice	Fire-cracked chert	1.3	1.3
108-8	Surface unit 108-8	35.000.00	Surfice	Sandstone	1.1	1.1
109-9	Surface unit 109-9	35.000.00	Surfice	Shale	1.6	1.6
110-10	Surface unit 110-10	35.000.00	Surfice	Chalcedony, mica.	0.3	0.3
111-11	Surface unit 111-11	35.000.00	Surfice	Fire-cracked rock	2.1	2.1
112-12	Surface unit 112-12	35.000.00	Surfice	Calcareous	1.3	1.3
113-13	Surface unit 113-13	35.000.00	Surfice	Plate, smoothed	1.0	1.0
114-14	Surface unit 114-14	35.000.00	Surfice	Shale, inferior	0.8	0.8
115-15	Surface unit 115-15	35.000.00	Surfice	Fire-cracked rock	0.1	0.1
116-16	Surface unit 116-16	35.000.00	Surfice	Shale, rounded	2.2	2.2
117-17	Surface unit 117-17	35.000.00	Surfice	Fire-cracked chert	0.3	0.3
118-18	Surface unit 118-18	35.000.00	Surfice	Sandstone	0.3	0.3
119-19	Surface unit 119-19	35.000.00	Surfice	Conular shell	0.6	0.6
120-20	Surface unit 120-20	35.000.00	Surfice	Chalcedony, stone, unmodified	0.3	0.3
121-21	Surface unit 121-21	35.000.00	Surfice	Plate, inferior	1.7	1.7
122-22	Surface unit 122-22	35.000.00	Surfice	Plate, smooth	0.4	0.4
123-23	Surface unit 123-23	35.000.00	Surfice	Shale	1.9	1.9
124-24	Surface unit 124-24	35.000.00	Surfice	Fire-cracked rock	1.0	1.0
125-25	Surface unit 125-25	35.000.00	Surfice	Calcareous	1.3	1.3
126-26	Surface unit 126-26	35.000.00	Surfice	Calcareous	1.2	1.2
127-27	Surface unit 127-27	35.000.00	Surfice	Cal	0.9	0.9
128-28	Surface unit 128-28	35.000.00	Surfice	Plate, inferior	4.3	4.3
129-29	Surface unit 129-29	35.000.00	Surfice	Fire-cracked rock	1.4	1.4
130-30	Surface unit 130-30	35.000.00	Surfice	Fire-cracked chert	1.3	1.3
131-31	Surface unit 131-31	35.000.00	Surfice	Sandstone	1.3	1.3
132-32	Surface unit 132-32	35.000.00	Surfice	Shale	1.2	1.2
133-33	Surface unit 133-33	35.000.00	Surfice	Shale, broken	2.1	2.1
134-34	Surface unit 134-34	35.000.00	Surfice	Sandstone	1.2	1.2
135-35	Surface unit 135-35	35.000.00	Surfice	Plate, inferior	4.4	4.4
136-36	Surface unit 136-36	35.000.00	Surfice	Shale	1.2	1.2
137-37	Surface unit 137-37	35.000.00	Surfice	Shale	1.2	1.2
138-38	Surface unit 138-38	35.000.00	Surfice	Shale	1.2	1.2
139-39	Surface unit 139-39	35.000.00	Surfice	Plate, secondary decolorization	2.6	2.6
140-40	Surface unit 140-40	35.000.00	Surfice	Plate, exterior	6.9	6.9
141-41	Surface unit 141-41	35.000.00	Surfice	Sandstone	1.5	1.5
142-42	Surface unit 142-42	35.000.00	Surfice	Shale	1.2	1.2
143-43	Surface unit 143-43	35.000.00	Surfice	Fire-cracked chert	4.4	4.4
144-44	Surface unit 144-44	35.000.00	Surfice	Sandstone	1.2	1.2
145-45	Surface unit 145-45	35.000.00	Surfice	Shale	1.2	1.2
146-46	Surface unit 146-46	35.000.00	Surfice	Plate, exterior	0.2	0.2
147-47	Surface unit 147-47	35.000.00	Surfice	Fire-cracked rock	10.4	10.4
148-48	Surface unit 148-48	35.000.00	Surfice	Sandstone	12.5	12.5
149-49	Surface unit 149-49	35.000.00	Surfice	Shale	14.7	14.7
150-50	Surface unit 150-50	35.000.00	Surfice	Chalcedony, stone, unmodified	40.9	40.9
151-51	Surface unit 151-51	35.000.00	Surfice	Plate, broken	2.3	2.3
152-52	Surface unit 152-52	35.000.00	Surfice	Fire-cracked rock	4.3	4.3
153-53	Surface unit 153-53	35.000.00	Surfice	Shale	1.1	1.1
154-54	Surface unit 154-54	35.000.00	Surfice	Plate, smooth	0.3	0.3
155-55	Surface unit 155-55	35.000.00	Surfice	Shale	1.2	1.2
156-56	Surface unit 156-56	35.000.00	Surfice	Plate, smooth	1.7	1.7
157-57	Surface unit 157-57	35.000.00	Surfice	Fire-cracked rock	36.5	36.5
158-58	Surface unit 158-58	35.000.00	Surfice	Sandstone	13.8	13.8
159-59	Surface unit 159-59	35.000.00	Surfice	Chalcedony, stone, unmodified	9.7	9.7
160-60	Surface unit 160-60	35.000.00	Surfice	Calcareous, leached	15.0	15.0
161-61	Surface unit 161-61	35.000.00	Surfice	Plate, broken	38.2	38.2
162-62	Surface unit 162-62	35.000.00	Surfice	Fire-cracked rock	34.9	34.9
163-63	Surface unit 163-63	35.000.00	Surfice	Shale	41.8	41.8
164-64	Surface unit 164-64	35.000.00	Surfice	Plate, smooth	2	2
165-65	Surface unit 165-65	35.000.00	Surfice	Shale	5.6	5.6
166-66	Surface unit 166-66	35.000.00	Surfice	Plate, inferior	1.7	1.7
167-67	Surface unit 167-67	35.000.00	Surfice	Fire-cracked rock	17.1	17.1
168-68	Surface unit 168-68	35.000.00	Surfice	Sandstone	1.3	1.3
169-69	Surface unit 169-69	35.000.00	Surfice	Chalcedony, stone, unmodified	48	48
170-70	Surface unit 170-70	35.000.00	Surfice	Plate, inferior	41.1	41.1
171-71	Surface unit 171-71	35.000.00	Surfice	Shale	55	55
172-72	Surface unit 172-72	35.000.00	Surfice	Fire-cracked rock	13	13
173-73	Surface unit 173-73	35.000.00	Surfice	Shale	22.0	22.0
174-74	Surface unit 174-74	35.000.00	Surfice	Plate, smooth	45.3	45.3
175-75	Surface unit 175-75	35.000.00	Surfice	Fire-cracked chert	14.5	14.5
176-76	Surface unit 176-76	35.000.00	Surfice	Sandstone	16	16
177-77	Surface unit 177-77	35.000.00	Surfice	Chalcedony, stone, unmodified	28.9	28.9
178-78	Surface unit 178-78	35.000.00	Surfice	Plate, inferior	11.0	11.0
179-79	Surface unit 179-79	35.000.00	Surfice	Shale	19	19
180-80	Surface unit 180-80	35.000.00	Surfice	Fire-cracked chert	24.7	24.7
181-81	Surface unit 181-81	35.000.00	Surfice	Sandstone	23	23
182-82	Surface unit 182-82	35.000.00	Surfice	Chalcedony, stone, unmodified	10.0	10.0
183-83	Surface unit 183-83	35.000.00	Surfice	Plate, inferior	24.0	24.0
184-84	Surface unit 184-84	35.000.00	Surfice	Shale	11.0	11.0
185-85	Surface unit 185-85	35.000.00	Surfice	Fire-cracked chert	10.0	10.0
186-86	Surface unit 186-86	35.000.00	Surfice	Sandstone	19.0	19.0
187-87	Surface unit 187-87	35.000.00	Surfice	Chalcedony, stone, unmodified	24.0	24.0
188-88	Surface unit 188-88	35.000.00	Surfice	Plate, inferior	11.0	11.0
189-89	Surface unit 189-89	35.000.00	Surfice	Shale	11.0	11.0
190-90	Surface unit 190-90	35.000.00	Surfice	Fire-cracked rock	10.0	10.0
191-91	Surface unit 191-91	35.000.00	Surfice	Shale	11.0	11.0
192-92	Surface unit 192-92	35.000.00	Surfice	Plate, smooth	10.0	10.0
193-93	Surface unit 193-93	35.000.00	Surfice	Shale	11.0	11.0
194-94	Surface unit 194-94	35.000.00	Surfice	Fire-cracked chert	10.0	10.0
195-95	Surface unit 195-95	35.000.00	Surfice	Sandstone	11.0	11.0
196-96	Surface unit 196-96	35.000.00	Surfice	Chalcedony, stone, unmodified	10.0	10.0
197-97	Surface unit 197-97	35.000.00	Surfice	Plate, inferior	10.0	10.0
198-98	Surface unit 198-98	35.000.00	Surfice	Shale	11.0	11.0
199-99	Surface unit 199-99	35.000.00	Surfice	Fire-cracked rock	10.0	10.0
200-200	Surface unit 200-200	35.000.00	Surfice	Shale	11.0	11.0
201-201	Surface unit 201-201	35.000.00	Surfice	Plate, smooth	10.0	10.0
202-202	Surface unit 202-202	35.000.00	Surfice	Shale	11.0	11.0
203-203	Surface unit 203-203	35.000.00	Surfice	Fire-cracked chert	10.0	10.0
204-204	Surface unit 204-204	35.000.00	Surfice	Sandstone	11.0	11.0
205-205	Surface unit 205-205	35.000.00	Surfice	Chalcedony, stone, unmodified	10.0	10.0
206-206	Surface unit 206-206	35.000.00	Surfice	Plate, inferior	10.0	10.0
207-207	Surface unit 207-207	35.000.00	Surfice	Shale	11.0	11.0
208-208	Surface unit 208-208	35.000.00	Surfice	Fire-cracked rock	10.0	10.0
209-209	Surface unit 209-209	35.000.00	Surfice	Shale	11.0	11.0
210-210	Surface unit 210-210	35.000.00	Surfice	Plate, smooth	10.0	10.0
211-211	Surface unit 211-211	35.000.00	Surfice	Shale	11.0	11.0
212-212	Surface unit 212-212	35.000.00	Surfice	Fire-cracked chert	10.0	10.0
213-213	Surface unit 213-213	35.000.00	Surfice	Sandstone	11.0	11.0
214-214	Surface unit 214-214	35.000.00	Surfice	Chalcedony, stone, unmodified	10.0	10.0
215-215	Surface unit 215-215	35.000.00	Surfice	Plate, inferior	10.0	10.0
216-216	Surface unit 216-216	35.000.00	Surfice	Shale	11.0	11.0
217-217	Surface unit 217-217	35.000.00	Surfice	Fire-cracked rock	10.0	10.0
218-218	Surface unit 218-218	35.000.00	Surfice	Shale	11.0	11.0
219-219	Surface unit 219-219	35.000.00	Surfice	Plate, smooth	10.0	10.0
220-220	Surface unit 220-220	35.000.00	Surfice	Shale	11.0	11.0
221-221	Surface unit 221-221	35.000.00	Surfice	Fire-cracked chert	10.0	10.0
222-222	Surface unit 222-222	35.000.00	Surfice	Sandstone	11.0	11.0
223-223	Surface unit 223-223	35.000.00	Surfice	Chalcedony, stone, unmodified	10.0	10.0
224-224	Surface unit 224-224	35.000.00	Surfice	Plate, inferior	10.0	10.0
225-225	Surface unit 225-225	35.000.00	Surfice	Shale	11.0	11.0
226-226	Surface unit 226-226	35.000.00	Surfice	Fire-cracked rock	10.0	10.0
227-227	Surface unit 227-227	35.000.00	Surfice	Shale	11.0	11.0
228-228	Surface unit 228-228	35.000.00	Surfice	Plate, smooth	10.0	10.0
229-229	Surface unit 229-229	35.000.00	Surfice	Shale	11.0	11.0
230-230	Surface unit 230-230	35.000.00	Surfice	Fire-cracked chert	10.0	10.0
231-231	Surface unit 231-231	35.000.00	Surfice	Sandstone	11.0	11.0
232-232	Surface unit 232-232	35.000.00	Surfice	Chalcedony, stone, unmodified	10.0	10.0
233-233	Surface unit 233-233	35.000.00	Surfice	Plate, inferior	10.0	10.0
234-234	Surface unit 234-234	35.000.00	Surfice	Shale	11.0	11.0
235-235	Surface unit 235-235	35.000.00	Surfice	Fire-cracked rock	10.0	10.0
236-236	Surface unit 236-236	35.000.00	Surfice	Shale	11.0	11.0
237-237	Surface unit 237-237	35.000.00	Surfice	Plate, smooth	10.0	10.0
238-238	Surface unit 238-238	35.000.00	Surfice	Shale	11.0	11.0
239-239	Surface unit 239-239	35.000.00	Surfice	Fire-cracked chert	10.0	10.0
240-240	Surface unit 240-240	35.000.00	Surfice	Sandstone	11.0	11.0
241-241	Surface unit 241-241	35.000.00	Surfice	Chalcedony, stone, unmodified	10.0	10.0
242-242	Surface unit 242-242	35.000.00	Surfice	Plate, inferior	10.0	10.0
243-243	Surface unit 243-243	35.000.00	Surfice	Shale	11.0	11.0
244-244	Surface unit 244-244	35.000.00	Surfice	Fire-cracked rock	10.0	10.0
245-245	Surface unit 245-245	35.000.00	Surfice	Shale	11.0	11.0
246-246	Surface unit 246-246	35.000.00	Surfice	Plate, smooth	10.0	10.0
247-247	Surface unit 247-247	35.000.00	Surfice	Shale	11.0	11.0
248-248	Surface unit 248-248	35.000.00	Surfice	Fire-cracked chert	10.0	10.0
249-249	Surface unit 249-249	35.000.00	Surfice	Sandstone	11.0	11.0
250-250	Surface unit 250-250	35.000.00	Surfice	Chalcedony, stone, unmodified	10.0	10.0
251-251	Surface unit 251-251	35.000.00	Surfice	Plate, inferior	10.0	10.0
252-252	Surface unit 252-252	35.000.00	Surfice	Shale	11.0	11.0
253-253	Surface unit 253-253	35.000.00	Surfice	Fire-cracked rock	10.0	10.0
254-254	Surface unit 254-254	35.000.00	Surfice	Shale	11.0	11.0
255-255	Surface unit 255-255	35.000.00	Surfice			

APPENDIX C
Answers Received

APPENDIX C

APPENDIX C

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Prestige Denominations

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Cannabis Use During Pregnancy

APPENDIX C

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APPENDIX C

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APPENDIX C
Answers Received

APPENDIX C

DATA MANAGEMENT

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APPENDIX C Annals Recovered

Democracy & Development

APPENDIX C

Artifacts Recovered

Bivariate Survival Test

Project Name: Stream Structure Testing						
Col. #	Unit Name	Grid Location	Depth (cm)	Artifact Description	Cl.	Wt.
1	Test unit 1	1-10	0-10	Poll tab, aluminum	5	3.8
1	Test unit 1	1-10	0-10	Micaeous aluminum	1	0.7
1	Test unit 1	1-10	0-10	Nail, tapered	2	6.5
1	Test unit 1	1-10	0-10	Tin can fragment	1	4.12
1	Test unit 1	1-10	0-10	Metal, unidentified	106	22.1
1	Test unit 1	1-10	0-10	Plastic, unidentified	13	3.4
1	Test unit 1	1-10	0-10	Mixed sand	5	1.4
1	Test unit 1	1-10	0-10	Battery, carbon rod	5	1.3
1	Test unit 1	1-10	0-10	Brace, fragment	5	1.3
1	Test unit 1	1-10	0-10	Sandstone	473	10.0
1	Test unit 1	1-10	0-10	Fire-cracked rock	1	0.1
1	Test unit 1	1-10	0-10	Shale	69	1.5
1	Test unit 1	1-10	0-10	Flake, retouch	2	0.5
1	Test unit 1	1-10	0-10	Flake, broken	1	0.2
1	Test unit 1	1-10	0-10	Flake, interior	1	0.1
1	Test unit 1	1-10	0-10	Unidentified stone	2	0.8
1	Test unit 1	1-10	0-10	Glass, broken bottle	1	0.1
1	Test unit 1	1-10	0-10	Plastic, clear bottle	1	0.1
1	Test unit 1	1-10	0-10	Plastic, microlitter	1	0.1
1	Test unit 1	1-10	0-10	Nail, fragment	1	0.1
1	Test unit 1	1-10	0-10	Tin can fragment	1	0.1
1	Test unit 1	1-10	0-10	Metal, unidentified	128	6.5
1	Test unit 1	1-10	0-10	Flake, primary decorative	1	0.4
1	Test unit 1	1-10	0-10	Flake, retouch	0.1	0.4
1	Test unit 1	1-10	0-10	Charcoal, unidentified	1	0.1
1	Test unit 1	1-10	0-10	Musel shell	6	13.4
1	Test unit 1	1-10	0-10	Metal, unidentified	0.7	0.7
1	Test unit 1	1-10	0-10	Aluminum foil	1	0.1
1	Test unit 1	1-10	0-10	Burned clay	1	0.4
1	Test unit 1	1-10	0-10	Brulee chip	62	6.2
1	Test unit 1	1-10	0-10	Shell case, 27 cal.	2	2.3
1	Test unit 1	1-10	0-10	Metal, fragment	4	4.3
1	Test unit 1	1-10	0-10	Charcoal, unidentified	26	3.9
1	Test unit 1	1-10	0-10	Metal, unidentified	1	0.1
1	Test unit 1	1-10	0-10	Sandstone	157	1.3
1	Test unit 1	1-10	0-10	Metal, unidentified	1	0.1
1	Test unit 1	1-10	0-10	Poll tab, aluminum	1	0.1
1	Test unit 1	1-10	0-10	Red tab, aluminum	1	0.1
1	Test unit 1	1-10	0-10	Metal, unidentified	1	0.1
1	Test unit 1	1-10	0-10	Flake, interior	1	0.1
1	Test unit 1	1-10	0-10	Shale	14	1.4
1	Test unit 1	1-10	0-10	Sandstone	645	6.5
1	Test unit 1	1-10	0-10	Fire-cracked rock	1	0.1
1	Test unit 1	1-10	0-10	Shale	116	1.6
1	Test unit 1	1-10	0-10	Flake, primary decorative	1	0.1
1	Test unit 1	1-10	0-10	Flake, retouch	1	0.1
1	Test unit 1	1-10	0-10	Flake, interior	27	9.1
1	Test unit 1	1-10	0-10	Shale, interior	2	0.9
1	Test unit 1	1-10	0-10	Flake, broken	27	2.4
1	Test unit 1	1-10	0-10	Flake, primary decorative	1	0.1
1	Test unit 1	1-10	0-10	Flake, secondary decorative	1	0.1
1	Test unit 1	1-10	0-10	Fire-cracked rock	1	0.1
1	Test unit 1	1-10	0-10	Shale	2	2.4
1	Test unit 1	1-10	0-10	Shale	2	0.9
1	Test unit 1	1-10	0-10	Flake, primary decorative	1	0.1
1	Test unit 1	1-10	0-10	Flake, broken	1	0.1
1	Test unit 1	1-10	0-10	Shale	30	2.5
1	Test unit 1	1-10	0-10	Flake, interior	27	5.5
1	Test unit 1	1-10	0-10	Shale	2	0.9
1	Test unit 1	1-10	0-10	Flake, retouch	27	2.4
1	Test unit 1	1-10	0-10	Shale	2	0.9
1	Test unit 1	1-10	0-10	Surface	219	6.5
1	Test unit 1	1-10	0-10	Surface, general	10	4
1	Test unit 1	1-10	0-10	Surface	10	4
1	Test unit 1	1-10	0-10	Bifacial scraper	1	0.1
1	Test unit 1	1-10	0-10	Dent point item/Plane (Smith)	1	0.1

APPENDIX C

APPENDIX C

Contract No.: DACW19-00-C-0132

Santana Training

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APPENDIX C
Avianfa Recovered

Project: Downstream Stockton Testing

Contract No.: DACW41-90-C-0032

Cat. #	Unit Name	Grid Location	Depth (cm)	Avifa Description	C.L.	W.L.
68-1	Pondhole Area 22	-300.00/040.00	30-40	Flake, avocet	-	0.5
68-1	Pondhole Area 23	-300.00/050.00	20-30	Flake, avocet	-	0.5
68-1	Pondhole Area 24	-300.00/060.00	40-50	Fine-crushed rock	-	2.3
70-1	Pondhole Area 25	-300.00/070.00	30-40	Flake, avocet	-	0.2
71-1	Pondhole Area 25	-300.00/070.00	40-50	Fine-crushed chert	-	0.4
72-1						

PART I - SECTION C

APPENDIX D. SCOPE OF WORK

Archeological Testing of Nine Sites
for Determination of Eligibility to the
National Register of Historic Places
Downstream of the Stockton Lake Project, Missouri

1. INTRODUCTION

- a. Nine archeological sites, located downstream of the Stockton Lake on sloughing easement lands, shall be extensively tested to evaluate site conditions and potential National Register of Historic Places (NRHP) eligibility. The site testing required under this contract shall extend from the banks of the Sac River to the outer boundary limitations of the easements. Though the actual boundaries of the sites may extend beyond the boundary limitations of the easement lands, only those portions of the sites within the easement lands shall be tested. No investigations shall occur on private lands outside of the Government's easement.

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- b. Only site 21CE445 is affiliated with a specific cultural period, the Late Archaic/Early Woodland Period. The cultural affiliation of all other sites are unknown at this time. The horizontal and vertical extents of all sites within the easement lands are unknown. Sites to be tested are listed below.
- | | | |
|----------|---------|---------|
| 21CE46-C | 23CE440 | 23CE441 |
| 23CE444 | 23CE445 | 23SR291 |
- c. Sites 21CE46-C, 23CE441, and 23SR291 are surface sites. (Site 23SR291 is a rock shelter with talus slope.) Sites 21CE440, 21CE442 (Localities a and b), 23CE445, are buried sites ranging from 2.2 to 3.9 meters below the surface. Sites 23CE439 (Localities a, b, c), 23CE444, and 23CE446 are complex sites with both surface and buried components.

- (1) Site 21CE439 was originally given three separate site numbers, 23CE437, 23CE438, and 21CE439. However, during the testing program these sites are adjacent in spatial delineation and are to be treated as one stratified site with surface and buried cultural zones. For this contract, site 21CE439 shall be Locality a, 23CE438 shall be Locality b, and 21CE437 shall be Locality c. It has been reported that Locality c has a cultural zone approximately 20 centimeters thick, 3 meters below the surface. Artifacts from Locality b have been observed approximately 4.5 meters below the surface and Locality a is a surface component with an unknown depth.

- (2) Site 23CE442 was also given two separate site numbers, 23CE442 and 23CE443. For the purpose of this contract, the two sites which are in proximity to each other, each approximately 2.2 meters below the surface shall be treated as one site. Site 23CE442 shall be designated Locality a and 21CE443 shall be designated as Locality b.

2. WORK REQUIREMENTS

- a. This work encompasses an intensive investigation sufficient to determine the nature of prehistoric archaeological resources present; (1) their areal (horizontal and vertical) and temporal extent; (2) their cultural and scientific importance; (3) their potential eligibility for the NRHP; and (4) possible alternatives for the mitigation of potential NRHP eligible sites.
- b. The Contractor and his staff shall conduct the study in a professional manner, using accepted methodology in accordance with the "Archaeological and Historic Preservation: Secretary of the Interior's Standards and Guidelines" listed below. These standards and guidelines are presented in the Federal Register, Vol. 48, No. 190, September 29, 1983.

Standards and Guidelines for Preservation Planning
Standards and Guidelines for Identification
Standards and Guidelines for Evaluation
Standards and Guidelines for Archeological Documentation

3. STAFF REQUIREMENTS

- a. Key Personnel: The Project Director, Principal Investigator, and Project Archeologist (who shall perform as the Laboratory and Field Director, if these positions are not performed by the Principal Investigator) are considered key personnel for this contract. The Contractor's Project Director is that person who oversees and administers the contract. The Principal Investigator is the person responsible for the day-to-day activities during the contract: field supervision, laboratory analysis, report write-up, etc. The Principal Investigator shall be in the field a minimum of 2 days for each 3 days of the field investigation and shall be the major author in the write-up of the draft and final report of findings. The Project Archeologist shall act under the direct supervision of the Principal Investigator. The Contractor agrees that the key personnel identified with the Contractor's offer shall be those utilized in the performance of this contract.

- (1) Any changes in the key personnel during the course of this contract shall be submitted in writing and those changes must be approved by the Contracting Officer in writing. Any new key personnel, not identified in the basic contract, must meet the minimum qualifications set forth below.

- (2) No key personnel position may be vacant for more than thirty (30) days during the course of this contract. Failure to replace the key personnel in that time frame may result in termination of this contract for default.

- (3) Vitae of key personnel must be included with the Contractor's offer and must specify the experience and qualifications the personnel have to fulfill this contract. The

Principal Investigator's vita shall be annotated to indicate which previous experience fulfills the requirements indicated in Paragraphs 3b (1), (a), (b), (c) and (d) below.

b. Principal Investigator: Minimum Qualifications are set forth for this Person in the Secretary of Interior's Standards and Guidelines, provided on page 44738 in the Federal Register, Vol. 48, No. 190, September 29, 1983. In amplification of the minimum qualifications, the Principal Investigator shall be a professional in archeology and have a minimum of 36 months experience as follows:

- (1) Twelve (12) months of archeological field work.
(2) Twelve (12) months of field work experience in boundary location (including a total of twenty-four (24) months of field experience);
(3) Twelve (12) months in laboratory work and analysis of archeological data; and,

(4) Experience as a Principal Investigator in at least two (2) comparable archeological investigations in number of sites tested and scope prior to this contract.

c. Other Key Field and Laboratory Personnel: The Project besides the Principal Investigator and laboratory personnel Bachelor's Degree in archeology or anthropology. These personnel shall have at least twelve (12) months of previous experience performing the duties to which they are assigned in this contract. Vitae of those key personnel shall be provided and annotated with the specific experience which qualifies them for the position proposed.

d. Consultants: Personnel hired or subcontracted for their experiential expertise and experience must have academic and professional qualifications in their own fields of competence.

4. STATEMENT OF CONTRACT SERVICES

- a. The Contractor shall provide services which are specified in the Scope-of-Work.
b. The Contractor shall accomplish work which includes, but is not limited to, the following:

- (1) Extensive archeological site testing.

- (2) Data collection - literature search, cultural materials, soil stratification information.
 - (3) Data analysis/interpretation - identification of cultural materials recovered, interpretation, mapping, analysis of data;
 - (4) Site documentation including maps, forms, photographs, reports;
 - (5) Thoroughly supported and documented recommendations for the NRHP significance of sites;
 - (6) Preparation of cultural materials for return to the landowners; and
 - (7) Delivery of recovered materials to the landowners and documentary date to the Planning Division, Kansas City District Office, U. S. Army Corps of Engineers.
- c. Products the Contractor shall deliver include, but are not limited to, the following:
- (1) Research design;
 - (2) Monthly work progress reports and earnings schedules;
 - (3) Brief summary of findings;
 - (4) Draft and final reports of findings;
 - (5) Site Maps, specialized information, background data;
 - (6) Professional article;
 - (7) Narrative slide program; and,
 - (8) NRHP nomination forms.

- d. All products shall be mailed to the addresses below. Documentation shall be provided to the Government for all materials which are to be provided directly to the State Historic Preservation Officer (SHPO) and to the Archeological Survey of Missouri (ASM) by the Contractor.
- (1) All products, including billings, except those being submitted directly to the SHPO and ASM; shall be provided to the Government at:
- U.S. Corps of Engineers, Kansas City District
ATTN: CEMRK-PD-R (Ms. Lucido, Room 624)
700 Federal Building
601 East 12th Street
Kansas City, Missouri 64108-2896
- DACW1-89-R-0487

(2) SHPO - One (1) copy of the USGS maps, updated survey forms, and Cultural Resource Survey Project Summary Sheet (Exhibit 2) (reference page 19, paragraph 14, Site Maps, Survey Forms, Specialized Information and Background Data), shall be mailed to Dr. Brunner (the SHPO) at:

Dr. Frederick Brunner (Director and State Historic Preservation Officer)
Missouri Department of Natural Resources
P. O. Box 176
Jefferson City, Missouri 65102

(3) SHPO's Representative - One (1) copy of the USGS maps, updated survey forms, and Cultural Resource Survey Project Summary Sheet shall be mailed to Mr. Michael Weichman (the SHPO's Representative) at:

Mr. Michael Weichman
Missouri Department of Natural Resources
P. O. Box 176
Jefferson City, Missouri 65102

(4) ASM - One (1) copy of the USGS maps and updated survey forms shall be provided to:

Mr. Eric van Harteaeveldt
Archeological Survey of Missouri
University of Missouri-Columbia
Room 22-Switzler Hall
Columbia, Missouri 65211

S. SCHEDULE OF WORK AND PROGRESS REPORTS

a. The contractor shall submit all products by the date negotiated for this contract. The milestones identified in the "Delivery of Work" shall be followed explicitly. In the event the Contractor is delayed on the work due to causes beyond the control and without the fault of negligence of the Contractor, the contract period for completing the work on the delayed portions of the milestone schedule may be extended to one mutually agreed upon in writing by the Contracting Officer and the Contractor.

b. The Contractor shall complete all work and services on this project within 730 days after date of award. Critical elements of work are presented in this paragraph under Delivery of Work.

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DELIVERY OF WORK

Elements-of-Work

Subuit Draft Research Design

**(Government Review of Draft
Research Design)**

Submit Final Research Design

Begin Field Work

Complete Field Work

**Submit Brief Summary of Findings
and 10 copies (duplicated) of
8 X 10 photographs**

**Submit Drafts of Report of Findings,
Professional Article NRHP Nomination
Forms, Site Maps, Specialized Information,
Narrative Slide Program, Background Data,
6 copies (duplicated) of 8 X 10 photographs**

**(Government Review of Draft
Report and Associated Documents)**

**Submit Final Report of Findings and any
Required Revised Documents**

**(Government Review of Final Report
and Documents and Return of Final
Report to Contractor for
Reproduction)**

Submit Revised Final Report, if required

**Contract is completed with submittal of
90 copies of the Final Report**

**c. Scheduling of work shall be based on availability of
funds each fiscal year. All funds obligated by the Government
for fiscal years 1989 and 1990 shall be earned by the Contractor
no later than 31 August of the allocation years. Funds allocated
in fiscal year 1991 shall be earned by the 730th day after
contract award.**

**(1) The Contractor shall submit a proposed schedule for
fiscal year 1989 earnings with the draft research design and a
proposed schedule for fiscal years 1990 and 1991 earnings on or
by 1 MAR 1989 and 1 MAR 1990, respectively. The Contracting
Officer will approve these schedules prior to Contractor
implementation in each fiscal year.**

**(2) The Contractor shall develop these earnings
schedules on the form contained in Exhibit 2. The monthly
earnings schedule shall be a progress report indicating the
estimated and actual monthly earnings of each fiscal year's funds
based on the major activities performed under this contract.
This report will be used to monitor contract progress. This form
shall be completed as of the 1st day of each month and submitted
to the appropriate Planning Division, Cultural Resources
Coordinator in the Kansas City District Office by the 4th day of
each month.**

**d. The Contractor shall submit a monthly work progress
report. The report shall be 2-4 pages in length and contain a
detailed, accurate, up-to-date account of all work procedures and
results that have occurred from the first to last day of each
month. These reports minimally shall provide details on the
field investigations, site evaluations, laboratory processing,
and preparation of reports and documents analysis, to allow an
adequate assessment of progress. These reports shall also
include a time and task summary. The Time and Task Summary Form
to be submitted monthly is contained in Exhibit C. These reports
shall be completed as of the 1st day of the month and submitted
to the Government in the Kansas City District Office by the 4th
day of the month.**

6. RESPONSIBILITY FOR CORRECT DOCUMENTS

**a. The Contractor is expected to professionally edit and
review his work. Draft reports and other documents shall have
been edited by the Contractor for punctuation, spelling,
grammatical, stylistic, and typographical errors. Corrections
and clarifications shall be made by the Contracting Officer
during review. Work required for correction or classification
shall be completed and resubmitted within time schedule specified
after request for such service is made by the Contracting
Officer.**

**b. Following the Government review of final documents, the
Contractor shall make all changes and corrections required and
resubmit corrected originals and reproducible copies as required
by the Delivery of Work (paragraph 5).**

7. MEETINGS

**a. The Contractor shall attend coordination meetings with
the Government at the discretion of the Government. There shall
be at least one meeting held at the Contractor's field
headquarters during the field season and another meeting at the
Contractor's facilities during the laboratory and analysis
period.**

b. The Contractor and the Principal Investigator

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(archeologist in charge of the work) shall attend one meeting in the Kansas City District Office to discuss the review of the draft report.

c. By written request, the Contracting Officer may require the Contractor to furnish the services of technically qualified representatives to attend coordination meetings in addition to those specified above. Payment for such services will be made at the negotiated rate per discipline involved plus travel expenses computed in accordance with Government Joint Travel Regulations.

8. LITERATURE SEARCH

a. The Contractor shall conduct an extensive review of documentary sources which includes past documents and current literature to obtain comprehensive coverage of the archeological sites and to accumulate, develop, and interpret the acquired scientific and technological data. This review will include consultation with the Missouri SHPO and/or his representative and ASH. This item of work shall also include:

(1) A review of the NRHP and supplements, and the Missouri Master Plan for Archaeological Resources Protection;

(2) A review of all previous and on-going reports concerning cultural resources associated with the sites;

(3) A review of records, research, and pertinent library sources concerned with the cultural resources within the study boundaries for archeological information;

(4) A review of survey forms for the archeological sites tested during this contract to determine their location in relation to the project. A review of survey forms for known archeological sites in the region which may have some bearing on the site to be evaluated.

(5) Consultation with local individuals, and local, county, and federal government officials, archaeological and historical societies, and qualified professional and amateur authorities, who may have information about the sites.

b. Reports on cultural resources studies Downstream of the Stockton Lake Project are listed in Exhibit D. Reports produced by the U.S. Army Corps of Engineers are available for loan during the study or may be reviewed in the Kansas City District Office, Planning Division (Federated Office Building, Room 624).

9. RESEARCH DESIGN

a. The Contractor shall submit a research design based on the Secretary of the Interior's Standards and Guidelines and Master Plan for Archeological Protection in Missouri. This

research design, for extensive archeological site testing and subsurface investigation in the study area, will optimize the probability of revealing the presence of any intact cultural remains. The cultural manifestations at the project in a cultural-historical model that integrates current knowledge of defined cultural units shall be addressed in the research design.

b. The research design shall provide the rationale, goals and methods for investigations of prehistoric archeological properties including, but not limited to:

(1) The reasons for pursuing the proposed investigation;

(2) Hypotheses to be tested and the questions to be asked of the data; that is, what the investigator hopes to determine about past human activity including such items as occupational sequence, settlement patterns, subsistence strategies, chronology, trades and social networks;

(3) The explicit manner in which data will be collected and analyzed, and how these relate to the research goals;

(4) The testing strategies, including sampling fractions, test unit size (horizontal and vertical), configuration, and placement;

(5) Descriptive analytic techniques, including description of classification or typology to be used, the relationship of the techniques to research goals, and methods to interpret the data;

(6) Procedures used in processing, cataloging, and curation; and,

(7) Schedule and work effort estimates.

10. ARCHEOLOGICAL SITE TESTING

a. The Contractor shall diligently pursue the study in a professional manner. Field work shall begin after the Contracting Officer approves the research design. The Contractor shall also coordinate field schedules prior to initiation of field work and all field activities during the study with the Kansas City District, Planning Division Cultural Resources Coordinator and SHPO's representative.

b. At least ten (10) days before field work begins, the Contractor shall notify the Stockton Lake Project Manager and Contracting Officer approves the research design. The Contractor shall also coordinate field schedules prior to initiation of field work and all field activities during the study with the Kansas City District, Planning Division Cultural Resources Coordinator and SHPO's representative.

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investigation, the Contractor shall visit the project office to notify the above project personnel of the weekly work location and schedule. Should the Contractor return to the project after departing on the completion of field investigations, he or his staff shall again notify the appropriate project personnel listed above. The Contractor shall also notify agricultural tenants of the work to be performed on Government leased land prior to beginning work on those tracts.

c. NRHP testing shall be performed on sites identified in Paragraph 1. of the Scope of Work. Results of this testing shall indicate if these sites are eligible or not eligible for the NRHP. It will not be appropriate under this contract to recommend further or additional testing or site evaluation for eligibility of these sites; such is to be fully accomplished hereunder. Work up to the completion of the field investigation shall constitute 50% of the effort for this contract.

(1) The Contractor shall conduct sufficient investigations to provide an evaluation of sites in terms of published criteria of eligibility for the NRHP (36CFR Part 60 Federal Register, Vol. 41, No. 6, January 9, 1976 and 36CFR Part 63, Vol. 42, No. 181 September 21, 1977). The Contractor shall provide facts, substantiate and give his rationale justifying the decision of the sites suggested eligibility or non-eligibility determination for the NRHP. Site information which must be furnished shall include a detailed description of the nature and extent of the resources, as well as a detailed and convincing statement of significance if the site is considered to meet NRHP eligibility criteria.

(2) To evaluate the sites for the NRHP, the Contractor shall use Bulletins 12 and 16, (19 as applicable) and any updates as they become available, published by the US Department of the Interior, National Park Service, Interagency Resources Division for guidance. For each site, that appears to meet the NRHP eligibility criteria, the Contractor shall prepare a NRHP nomination form. One (1) draft copy of the form shall be submitted with the draft report of findings. After the draft copy has been reviewed, one (1) original and one (1) copy of a final version assimilating any Government comments shall be provided to the Government for review and processing.

(3) If a potential NRHP eligible site exists, the Contractor shall suggest research questions and outline a plan for mitigation. Based on the relative significance of the sites and likelihood of disturbance or destruction, rank the priorities for accomplishing suggested future mitigation work.

d. The site testing shall extend from the banks of the Sac River to the outer boundary limitations of the easements. These easements are currently in private ownership, but the Government has secured Right-of-Entries to allow the Contractor access to perform the work specific areas. No field investigation is permitted outside of the easement boundaries. Though the

boundaries of these sites may extend beyond the limitations of the easement areas, the testing shall only be performed within the easement boundaries. If upon investigation, the Contractor finds some sites identified as being within the easement areas are actually outside the easements, the sites shall not be investigated or tested under this contract. The Contractor shall conduct the site testing in the following manner:

(1) Examine all exposed or disturbed areas for surface and subsurface remains or components. Shovel testing is the most efficient and cost effective method or technique in locating the boundaries of the archeological sites. Shovel tests should be placed at 10 meter intervals although closer spacing may be required to define site boundaries or otherwise acquire needed site evaluation information. The Contractor may use an augering, coring or other program or some mix of the above, if in his professional judgment, such will be equally or more effective and efficient.

(2) Test units shall be 1 x 1 or 2 x 1 meter in size. No more than 30 square meters of test units shall be placed within the areal extent of sites 23CE44 and 23CE46. No more than 16 square meters of test units shall be placed within the areal extent of all other sites to evaluate surface components. Tests should be of sufficient size and depth to ascertain the presence or absence of cultural materials. Some portions of the study area may have experienced recent deposition and the depth of the tests shall be adjusted accordingly. It may be necessary to adjust the spacing, size and depth of test pits to accommodate the specific situation.

(a) Testing shall be conducted for deeply buried cultural deposits and shall extend no less than one meter below the surface. Soil stratification profiles shall be made and basic geomorphic data shall be collected.

1. Test trenches excavated by heavy equipment shall be no closer than 5 meters to the edge of the river bank and shall not change the geometry of the bank. Corps of Engineers' marker within the easement tracts shall not be disturbed during excavation.

2. The amount of soil which shall be excavated during trenching activities to determine the deeply buried components and soil information shall be addition to the calculations of the 16 to 30 meters limitations identified in paragraph d.2. to test the sites.

(b) All data collected during site testing shall be used to fulfill the discussions required under "Section 12. Report of Findings".

(3) Identify temporal placement of sites and site types represented.

(4) Collect all diagnostic artifacts, subsurface materials, and a sample only of other surface materials for the investigation of the sites. Prehistoric components. Any historic cultural artifacts found at the sites shall also be collected with the prehistoric materials even though historic components of sites shall not be evaluated for National Register significance.

(5) Collect materials for specialized studies such as absolute dating (e.g. Radio-carbon), paleontology, etc., when appropriate. Analysis will not occur without justification by the Contractor and written approval by the Contracting Officer.

(6) Process and catalog all recovered materials. All artifacts shall be labeled with site numbers.

(7) Perform all measurements using the metric system.

(8) Photograph all phases of field work, using black and white film, and color slides. Also, illustrate or photograph all features and diagnostic artifacts by either black and white photography or line drawings. Photographs are to be adequately cataloged and incorporated into the permanent records of the sites. Slides are to be provided to the Kansas City District Office.

(9) Various techniques as flotation and dry screening should be used, where feasible.

(10) Record all sites located incidental to this investigation on Missouri archeological site forms which are available from the ASH. All pertinent information must be provided, including site boundary maps). Universal Transverse Mercator (UTM) coordinates and legal provenience. Also, record provenience of features and include maps and graphs when applicable. Coordinate and obtain site number from the ASH for any new sites, if encountered.

(11) After the investigations are completed, document in writing the condition of the sites in accordance with 36CFR63.

(12) Fill in and return all test excavations made within the study area to the conditions existing prior to initiation of this field work on said property. Compensation for damages to crops shall be the responsibility of the Contractor.

(13) Maintain a complete and thorough record of all field activities including: field notebooks, site survey and other relevant forms; maps showing site locations, boundaries, locations of test pits, etc.; and a photographic record documenting the investigations. The Contractor shall maintain complete records of numbers of each type of test unit executed, manhours devoted to each field task, etc., and include with the final report, a time-and-task summary for all field and laboratory work performed.

11. BRIEF SUMMARY OF FINDINGS

The Contractor shall provide the Government with a brief summary of findings [of no more than 10 pages] of the testing. A discussion of the artifacts collected and an outline of any changes to the report content and format identified in Section 12. The Government will review and comment on this information. Comments shall be assimilated into the writing of the draft report.

12. REPORT OF FINDINGS

a. A report of findings shall be prepared by the Principal Investigator (archeologist) for the Contractor. The report shall be presented and organized in a manner and form readily usable and understandable by non-cultural-resource-trained personnel and the public. The main text of the report shall be written in a professional manner with a minimum of jargon. Detailed presentation and discussion of data of interest to the profession shall be included in a second volume to the report or as appendices. The report is intended to be used as a planning document for the U.S. Army Corps of Engineers. A summary of the results will also be included to be used by managers and planners. Use of tables, charts and illustrations is encouraged.

b. The report of findings shall be authored by the Principal Investigator and, if desired, key personnel or consultants. The Principal Investigator whose credentials are used to justify the assumption of professional work being performed shall be the major author of the report.

c. Thirteen (13) copies of a complete draft of the report shall be submitted to the Government for the purpose of review. For purposes of draft report review only, the Scope of Work and a list of principal staff personnel with their qualifications will be attached as an appendix. Work up to the submission of the draft report shall constitute 80% of the effort for this contract.

(1) If the draft report is not acceptable to the Government, the Contracting Officer may at his discretion require the Contractor to submit a revised draft report prior to submittal of the final report.

(2) The Government will submit the draft report to the Missouri SHPO, ASH, and the National Park Service for review and comment. The Contractor shall address their comments in the final report unless written justification can be provided to the contrary.

(3) All Corps of Engineers' comments whether in comment

or question form, agreed to in the draft report review meeting between the Government and the Contractor must be responded to and incorporated into the final report. The Contractor shall demonstrate to the Government in one of the following ways how and where the comments were answered in the final report. The Contractor can either:

- (a) provide an annotated copy of the draft report containing the actual changes that are made to the final document; or,

(b) if there is a need to explain the responses to the comments, provide separate written statements for each comment describing how the comments were responded to and on what pages and paragraphs of the final report the changes can be found; or,

(c) if the responses are obvious, the Contractor can provide the page numbers and paragraphs of the final report on which the changes were made.

(4) In addition to standard review procedures, the Contracting Officer may (at his discretion) send the draft report and Scope of Work to three (3) qualified professionals not associated with a State or Federal Government agency for peer review of the merits and acceptability of the report.

d. The Contractor shall then complete necessary revisions and submit the final, professionally edited report to the Government. The Contractor shall submit one (1) set of originals and two (2) copies of the final report of findings to the Government. The copies shall include all plates, maps, and graphics in place so that they may be used as patterns for assembling the final report. One (1) copy shall be assembled as a mock-up for reproducing the report in accordance with "Style Sheet II" (Exhibit E). The set of originals will remain the property of the U.S. Government and will be returned to the Government after reproduction.

(1) The Government will review and edit the final report and the assembled copy. If these are not acceptable, the Contractor shall make corrections and resubmit the final report and copy for review and approval.

(2) After acceptance, the Government will return the approved final report and aforementioned assembled copy to the Contractor. The Contractor shall provide 90 printed copies of the approved final report to the Government.

e. The report shall include:

- (1) Illustrations, photos, maps, tables, and graphic representations of data appropriate to the text, such as illustrations of features and diagnostic artifacts by either black and white photography or line drawings. Photographs of the

study sites, and if appropriate, examples of collections and old photographs from past studies;

(2) Photographs (black and white) with captions of representative archeological resources investigated during this site testing. Photographs can be placed in a section at the conclusion of the report, prior to the reference section;

(3) One map of the project area identifying archeological sites tested during this study, including, if known, cultural affiliation and site type, i.e., camp, quarry, food processing, etc. and other pertinent information. (Color overlay reproduction is allowed.) Maps for inclusion in the report must be presented in such a manner that exact site locations are not disclosed.

(4) Both the draft and the final reports (and all site forms) must contain official Missouri state site numbers.

f. The report shall be organized in the following manner:

(1) A brief synopsis, suitable for publication in an abstract journal, bound in front of the report thus serving as an Executive Summary of the findings, conclusions and recommendations;

(2) A completed Report Documentation Page, ND Form 1473, (Exhibit F) to be placed in the front of the final report;

(3) The following statements to be placed after the title page of the report:

(a) The study performed herein by the Contractor for the Corps of Engineers is authorized in the National Historic Preservation Act of 1966, as amended. Accomplishment of this work provides documentation evidencing compliance with Executive Order 11593 "Protection and Enhancement of the Cultural Environment" dated 13 May 1971, and Section 110 of the National Historic Preservation Act.

(b) Funds for this investigation and report were provided by the U.S. Army Corps of Engineers. The Corps contracted with [Contracting Firm's Name] for this Downstream Stockton Study and may not necessarily agree with the contents of this report in its entirety. The report reflects the professional views of the Contractor who is responsible for collection of the data, analysis, conclusions and recommendations.

(c) The Contractor designated a study team to make the investigation and the study team has drawn conclusions regarding the effects of power generation on the Sac River downstream of Stockton Dam. Since the U.S. Army Corps of Engineers does not wish to interfere with the professional independence of the study team, those conclusions remain in the

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study. However, it should be noted that the U.S. Army Corps of Engineers does not necessarily agree with conclusion of the study team regarding the effects of power generation.

(4) Table of Contents.

(5) Chapter 1. The Archeological Investigation: Purpose, and Previous Investigations:

(a) Purpose;

(b) Previous Investigations at the project: qhd

(c) Report Organization, discussion of where in the report is the identification of data mentioned in Sections 8, 9, and 10 of this Scope of Work.

(6) Chapter 2. Research Goals.

A copy of the approved research design (or a synopsis thereof), with detailed description of the methods used in field and laboratory work. (i.e., Research Design). This description should be of sufficient detail to allow for review and critique of the research design as it was actually implemented by or through archival, field, and laboratory investigations and analyses.

(7) Chapter 3. The Environmental Context of the Study.

A brief description of the study area, including land-use, topography, hydrology, geology, soils, flora and fauna, vegetational cover, and ground visibility as they relate to the investigation. Pertinent data contained in previous reports shall be incorporated by reference:

(a) Physiography, topography;

(b) Structural Geology, Soils;

(c) Hydrology and Drainage;

(d) Vegetation; and

(e) Fauna.

(8) Chapter 4. Geomorphology of the Project's River Valleys.

An Overview of Previous Investigations of the Quaternary Geology of the Drainage System.

(9) Chapter 5. Regional Culture Historical Background.

A brief descriptive cultural history of the project area, incorporating, by reference, the data contained in previous

reports; results of the literature search; and a more detailed discussion of the role of the archeological sites investigated by this study in the prehistory of the area;

(a) Paleoindian;

(b) Archaic;

(c) Woodland;

(d) Mississippian;

(e) Protohistoric; and

(f) Historic.

(10) Chapter 6. Site Descriptions.

(a) Each site description shall have a table at the beginning with site name (if any); cultural affiliation, topographic setting, parent material, drainage, the original recording agency, size of the site, surface visibility, slope, ground cover, vegetation, month and year of the field investigation; land-use; and elevation.

(b) The site descriptions shall include discussions of:

1 Previous investigations at each site;

2 Geomorphic Setting;

3 Investigations conducted by this contract; a discussion of each site investigated by this study as it relates to past studies and to the project area; a description of each site and discussion of the features and artifacts encountered, presented both in support of the discussion in the text, the research design and also as valuable data for professional use of the report;

4 Site Maps: one map showing the horizontal provenience and one map showing the vertical provenience of the site, artifact distribution and features investigated during this study. The maps shall indicate features, locations of tests, and other data critical to understanding each of the site's components; Profile maps of the soil stratification found at each site.

5 Profile maps or descriptive chart of the soil stratification found at each site;

6 Interpretations;

7 Recommendations; Statements of potential eligibility for nomination to NRHP, if any, and sufficient A brief descriptive cultural history of the project area, incorporating, by reference, the data contained in previous

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documentation to support any evaluation, i.e., potentially eligible or non-eligible in accordance with 36CFR63 and 36CFR0.6; if applicable, information on type of impacts, if any to the sites and recommendation for mitigation.

(11) Chapter 7. -Lithic Analysis.

(a) Definitions;

(b) Lithic Assemblages Descriptions;

(c) Comparison and Summary:

(12) Chapter 8. Ceramic Analysis.

(13) Chapter 9. Biological Analyses.

(a) Macrobotanical Analysis;

(b) Pollen Analysis;

(c) Opal Phytolith Analysis;

(d) Funeral Analysis;

(a) Human Remains, if any: Condition of Bone; Age and Sex; Representation of Elements and Individuals; Mortuary Practices; and Regional Comparison.

(14) Chapter 10. Site Evaluations, Research Goals, and Recommendations.

(15) Summary describing significance of each site, documentation of the condition of the site, and suggested valid research questions for the project area and sites suggested as eligible for the NHP and mitigation to be done at a later date. Research questions for future work shall be developed in accordance with the Advisory Council on Historic Preservation's "Treatment of Archeological Properties. A Handbook." November, 1980 and the Master Plan for Archeological Protection in Missouri. Specific impacts to sites such as agricultural practices, erosion, public vandalism noted during the investigation may be mentioned; however, suggested specific actions, such as deletion of tracts from agricultural leasing, riprap along shorelines, etc. for impacts belong in the Background Data to be submitted with the draft report.

(16) Glossary of Terms.

(17) Reference section, at the conclusion of the report, with all sources referred to in the text or used in the report, personal communications, interviews, bibliography, etc. All records, documents and publications consulted shall be listed in bibliographic style as contained in the American Anthropologist or American Antiquity. References to unpublished sources shall

include sufficient information to allow location of the documents by future researchers.

(18) List of the Principal Investigator and key field and lab personnel, with their qualifications, as an appendix; (draft report only); and,

(19) The Scope of Work as an appendix (draft report only).

13. NARRATIVE SLIDE PROGRAM, PROFESSIONAL ARTICLE AND PHOTOGRAPHS

a. A narrative slide program shall be prepared on the work accomplished under this contract. The Contractor shall furnish three copies of the slide program. Each copy shall contain sixty (60) plastic mounted Kodachrome color slides with a six (6) to ten (10) page, single-spaced written text on the methodology and results of this investigation suitable for incorporation into the project's public presentation programs. Suggestions for organization and content of the slide program follow.

(1) A simplified summary of the information gathered on the sites.

(2) Discussion of methods used to acquire information.

(3) Photographs or illustrations of the sites.

(4) Simplified map showing features and extent of the sites.

(5) Discussion of the sites' locations and their importance in the culture history.

(6) Artist's conception of cultural activities occurring at the sites.

(7) Brief discussion on the material and method by which the sites were created.

b. The Contractor shall prepare a professional article which details the work and findings produced under this contract. This article shall be suitable for publishing in a professional journal. The article shall be 10 to 15 pages, single-spaced. References shall be added as an addendum to the article.

c. Two copies of 16 different 8 X 10 black and white photographs illustrating aspects of the investigations shall be submitted. (The photographs shall be duplicated for a submittal total of 32 photographs.) Ten different photographs of the field work and sites shall be submitted with the Brief Summary of Findings and six different photographs of the laboratory work shall be submitted with the draft report. Each photograph shall

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be accompanied by a short concise caption.

14. SITE MAPS, SURVEY FORMS, SPECIALIZED INFORMATION AND BACKGROUND DATA

a. Site Maps and Survey Forms. Materials dealing with exact site locations are considered confidential and are not to be published or released. Documentation shall be provided to the Government for all materials which are to be provided directly to the SHPO, SHPO's Representative and ASH by the Contractor. Materials which shall accompany the draft report but which are not to be included in the report consist of:

(1) Three (3) collated copies of 7-1/2 minutes USGS maps and three (3) sets of aerial photographs with mylar overlays showing the locations of sites tested shall be provided to the Government. One (1) set of the USGS maps are to be furnished directly to the SHPO, one (1) set to the SHPO's Representative and one (1) set of maps to ASH.

(2) Updated survey forms of archeological sites to be tested under this contract, and new survey forms for any sites incidentally encountered during this investigation and not recorded on site forms, shall be completed. The Contractor shall record these sites on Missouri state archaeological survey forms in entirety. Three (3) copies of copies of survey forms for the sites shall be provided to the Government. One (1) copy of the forms shall be furnished directly to the SHPO, one (1) copy to the SHPO's Representative and one (1) copy to ASH. Each survey form is to contain Corps of Engineers Real Estate tract numbers in which the specific site is located and the UTM location.

(3) Two (2) original "Cultural Resource Survey Project Summary Sheets" (Exhibit 6) shall be provided to the State of Missouri. One (1) original shall be provided to the SHPO and one (1) original to the SHPO's Representative. A copy of this document shall be provided to the U.S. Army Corps of Engineers.

b. Specialized Information. Materials not suitable for publication in the report shall be submitted with the final report. These materials include repetitive photographs of the sites and collections from this study, photographs of representative cultural resources sites, all negatives of photos, feature maps, large amounts of specialized statistical data, a complete listing of all materials recovered and location of records, field notebooks, and other documentation not of interest to most readers of the report.

(1) Averages. Graphs or summaries of statistical data are to be included in the publishable report. Large masses of specialized statistical data, such as certain artifact measurements, shall be submitted on a 5 1/4 inch format magnetic disk for use on an IBM compatible microcomputer so that it can be made readily available to interested persons. Publication of

such bulk statistics in the report is not appropriate.

(2) The Contractor shall provide individual responses to all review comments on this report. The comments and responses are not intended for publication.

c. Background Data. Five (5) copies of information required as background data shall be bound and submitted with the draft report. These data are intended as a planning document by the Government and not for publication or release. Background data shall include:

(1) A site specific discussion of suggested mitigation methods, such as specific protection measures and data recovery etc., for sites that appear to meet NRHP eligibility criteria which were investigated during this study;

(a) Rationale for the selection of action with concise recommendations and justifications for both mitigative work and for accepting loss without data recovery shall be presented in accordance with ACHP's "Treatment of Archeological Properties: A Handbook," November, 1980, and other State of the Art references;

(b) if no action is suggested for a site, rationale for this recommendation should be stated in the background data.

(2) Tables listing (at a minimum) name/number of map reference, site designation, relation to the project types of threats, recommended actions, if any, and priority for future work in the following formats: One table listed by Real Estate tract number, one by Township/Range. Any other tables appropriate to management of cultural resources can also be included; and,

(3) Suggestions which could be added to a cultural resources management plan for the project and provide any suggestions for the use of cultural resources information in the interpretive programs.

15. DISPOSITION OF CULTURAL MATERIAL

a. Attached to the letter of transmittal for the final report shall be a cumulative inventory of all cultural materials found during these investigations. The Contractor shall deliver these materials to the landowners.

b. All original notes, records, maps, photographs, and other pertinent data gathered on this contract are the property of the U.S. Government and shall be provided to the Planning Division, Kansas City District Office, U. S. Army Corps of Engineers.

16. FURTHER RESPONSIBILITIES OF THE CONTRACTOR AND GOVERNMENT

a. Data Availability. The Government will provide the Contractor with the necessary USGS and Real Estate tract maps, serial photographs, available background information, remotely sensed data (if any) and correspondence as needed. In addition, the Government will provide support to the Contractor regarding suggestions on data sources, format of study outline and report, and review of study progress.

b. Right-of-Entry. Right-of-entry has been secured from all landowners on which the archeological investigation shall be performed. The Government shall provide copies of the right-of-entries to the Contractor prior to the initiation of field work.

c. Publication. It is expected that the Contractor and those in his employ, may during the term of the contract, present reports of the work to various professional societies and publications. Outlines or abstracts of those reports dealing with work sponsored by the Corps of Engineers shall be sent to the Kansas City District Office for review and written approval prior to presentation or publication. Proper credit shall be given to Corps of Engineers' sponsored work, and the Corps of Engineers shall be furnished six (6) copies of each paper presented and/or published reports. The report of findings and all associated documents shall become the property of the US Government and shall not be published or reproduced except in accordance with this contract without the express written permission of the US Army Corps of Engineers.

d. Court Testimony. In the event of controversy or court challenge, the Contractor shall make available, as appropriate, expert witnesses who performed work under this contract and shall testify on behalf of the Government in support of the findings. If a controversy or court challenge occurs and testimony of expert witnesses is required, an equitable adjustment will be negotiated.

e. Safety Requirements. The Contractor shall provide a safe working environment for all persons in his employ as prescribed by EM 385-1-1, "General Safety Requirement," a copy of which will be provided by the Government.

17. EQUIPMENT AND FACILITIES

The Contractor also must provide or demonstrate access to:

a. Adequate permanent office, field, and laboratory equipment necessary to conduct operations defined in the Scope of Work. The Government will not fund the purchase or lease of such

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